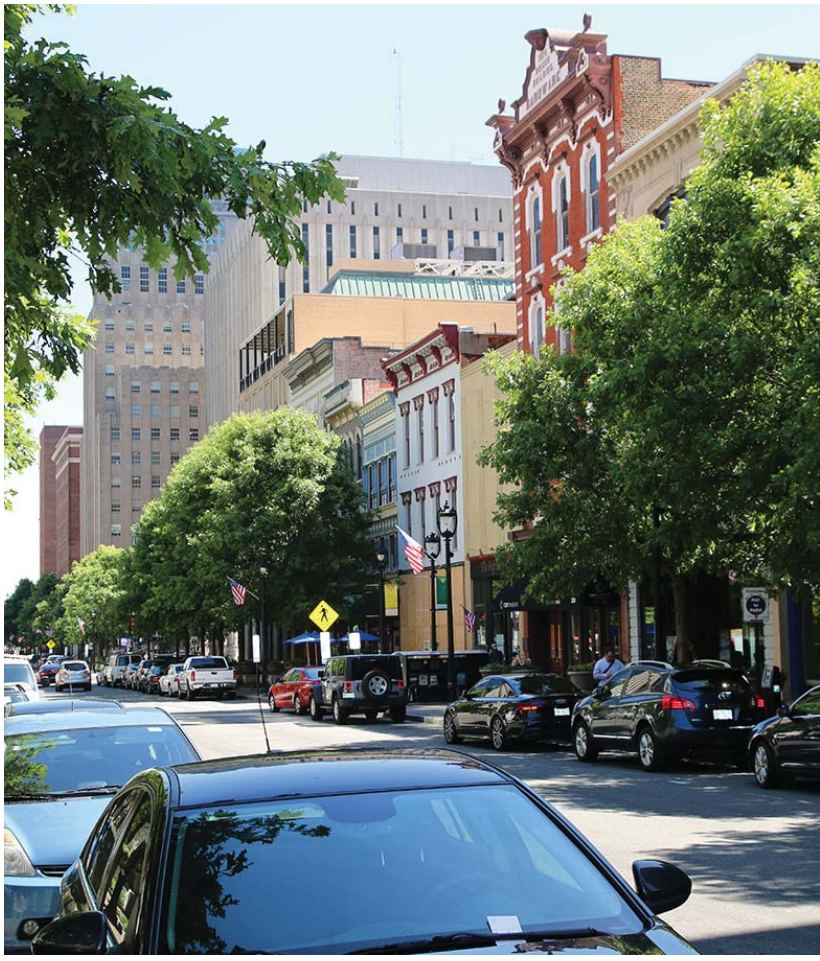
CITY OF RALEIGH

DOWNTOWN DEVELOPMENT AND FUTURE PARKING NEEDS STUDY



PARKING SUPPORT OF ECONOMIC DEVELOPMENT

FINAL

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PARKING SYSTEMS AS TOOLS TO PROVIDE ECONOMIC DEVELOPMENT SUPPORT

The Raleigh Downtown Development and Future Parking Needs Study was completed in early 2017 and consists of the following four technical memoranda:

- The Role of Parking in Supporting Economic Development
- Curb Lane Management Policy
- Urban Access Policy
- Park+ Parking Demand Model User's Manual

This memorandum addresses the role of parking in supporting Economic Development.

SECTION 1: INTRODUCTION

One of the main objectives of this study is the development of a strategic parking policy as it relates to the use of parking as a potential catalyst element in support of Downtown development. This includes policy guidance related to parking investment and the use of parking as a potential development incentive.

The overall study includes a Park+ Model, GIS-based tool to better track, manage, and understand parking supply/demand on an on-going basis, the provision of parking garage design guidelines to ensure high-quality facility design in conjunction with potential private sector partners, current planning information, and recommended parking requirements to help right-size parking supply in urban an environment.

This memorandum will explore how parking systems can be leveraged to serve as tools for economic development. Having a well-defined and shared vision relative to preferred or targeted types of development is an important first step in this task. This task report also will focus on the development of general guidelines related to parking and economic development incentives as well as the development of specific policies to better align parking asset development and management to support community and economic development goals.

SECTION 2: PARKING STRUCTURES AS A DEVELOPMENT CATALYST

Parking structures can serve as important catalysts in the preservation or redevelopment of downtown centers. Well designed and well located garages can become part of the revitalization of theater and shopping districts, help make downtown housing more attractive, and stop the withdrawal of retail and customers from downtown areas to suburban malls.

Contemporary, functional garages can be an asset to a city and its inhabitants and can make visiting downtown more appealing. There are three key elements to consider when planning for a parking structure—the driver, the pedestrian, and the context. Older parking structures have tended to focus on the car, the maximum number of spaces per floor, and driving patterns. This leaves out the pedestrian and the context.

A parking structure may be the first and last experience associated with a visit to a downtown area, so it needs to facilitate the transition from driver to pedestrian, from roadway to streetscape, and back again to create a positive experience for users. Successful urban parking structures address movement in a way that makes people wish to return.

For pedestrians, two significant considerations are safety and security. A parking garage needs good lighting with no hiding spaces. Structural elements should not block views so drivers exiting their cars can see exactly where to go to get to the elevator or stairway. Visitors to an urban parking garage need clear wayfinding information and directions that orient them to downtown destinations. The building itself is a sign. Stairway and elevator placement and design should offer these strong connections.

For drivers, tight dimensions of parking spaces and drive aisles, poor maneuverability, or unclear markers as to where and how to tum to find spaces may work in an employee or commuter garage, where people arrive early in the morning and know exactly what they must do to find a parking space. However, these challenges will not work for visitors who do not regularly park in a garage. Drivers must be able to easily maneuver through the garage and find parking spaces, which should be generous enough in width to allow for easy parking.

Parking garages also should address their context. How will the structure be integrated with historic buildings, ongoing developments, and open spaces, while providing enough flexibility to accommodate future growth and changes? Density, traffic, and pedestrian patterns; adjacencies; design guidelines; historic building codes; urban fabric; and neighborhood impact are all important factors to consider.

Parking structure design also can involve street and sidewalk enhancements as well as provide related public amenities that reinforce pedestrian vitality such as parkways, plazas, courtyards, bicycle and commuter facilities, and retail and commercial uses. In addition, the materials used and the scale of the garage in relation to existing buildings are important to consider as well as the integration of the structure through high-quality design and the incorporation of retail.

Parking structures are significantly more expensive to build than surface parking, but the payoff for revitalized downtowns can be well worth the cost. Historically, many parking structures constructed as part of redevelopment efforts did not charge for parking—the main intention of the facility was to support the surrounding commercial, retail, and entertainment uses. Many of these garages, however, were designed with infrastructure to accommodate parking revenue and access control system (PARCS) equipment in the future.

As towns and cities grow denser and efforts are made to create pedestrian-friendly, thriving downtowns, these once utilitarian structures are playing a more significant and integrated role in new developments.

SECTION 3: PARKING REQUIREMENTS REFORM UPDATE

The parking management field has advanced significantly in recent years with new programmatic and strategic planning approaches, emerging best practices, and technology solutions that can transform and expand the positive role that parking can play in helping communities achieve success. There are many opportunities for parking to be integrated into larger community and economic development strategies. Effective and collaborative relationships developed between parking management and Downtown stakeholders can transform and greatly enhance the vitality of Downtown environments. Parking is an activity that provides millions of customer impressions each year. Improvements to the ease of use of parking and parking customer service can have a dramatic impact on how a community is perceived and on the success of community businesses and the livability of its neighborhoods.

By evolving the parking program to better support the overall Downtown and community development objectives, the parking and access management program can better support opportunities to align parking and economic development, deliver a comprehensive and sustainable approach to community access strategies, and establish collaborative relationships with related agencies and community partners.

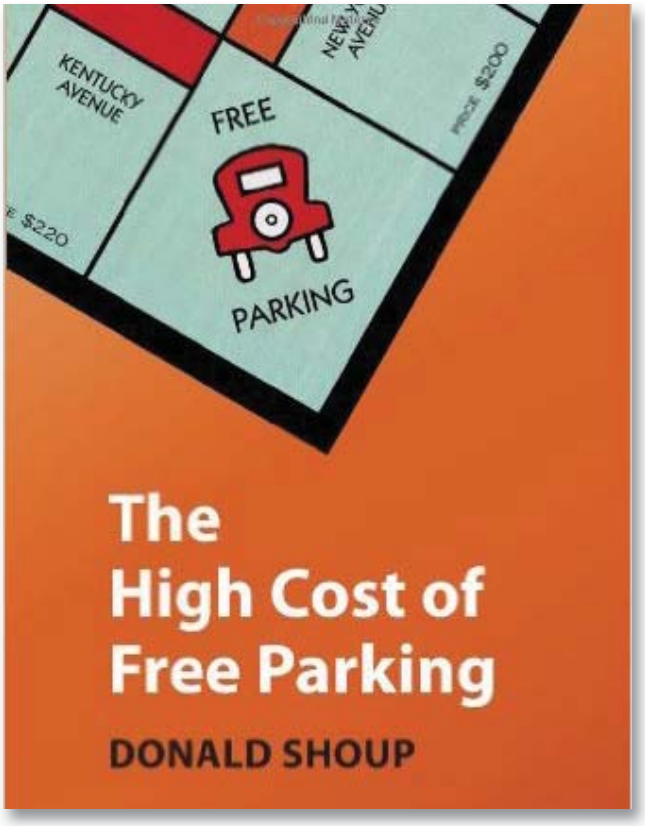
This specific document explores the changing approaches to municipal parking requirements (what is now referred to a parking requirements reform) as well as new approaches to parking facility development and financing. It also offers the City an opportunity to expand the way parking is viewed and describes the important role parking plays in creating vibrant, healthy communities and business districts. The report also promotes the philosophy that rather than focusing on parking in isolation, there needs to be a greater focus on overall Downtown access. In other words, parking should be viewed as being an integral component of a community access strategy, rather than a discipline in isolation from the larger transportation system. This broader focus on access management while keeping a focus on the importance of parking specific issues provides a more balanced and sustainable community transportation system.

PARKING REQUIREMENTS REFORM — THE SCHOLARLY DEBATE

There is a serious and significant national discussion occurring related to benefits and problems associated with the ubiquitous use of minimum parking requirements across the US and the world. Professor Donald Shoup, author of the High Cost of Free Parking and a Distinguished Professor of Urban Planning at UCLA, has led the charge in this area—promoting how parking policies can improve cities, the economy, and the environment. Shoup recommends that cities should charge fair market prices for on-street parking, use the meter revenue to finance added public services in the metered neighborhoods, and remove off-street parking requirements.

Recently, several other noted academicians and planners have weighed in on the discussion of the importance of parking in general, expanding the research related to minimum parking requirements and proposing new options for how cities should approach these issues. We will focus on three publications. The first is a book entitled Parking Management published by Mr. Todd Litman, founder of the Victoria Transport Policy Institute. The second is a recently published book by Richard Willson entitled Parking Reform Made Easy. The third is a book by Eran Ben-Joseph entitled Rethinking A Lot – The Design and Culture of Parking.

However, before discussing this further, there is another key issue worthy of exploration – the surprising importance of parking to transit oriented developments.



Parking and Transit Oriented Developments

The following is an excerpt from an article by Mark Gander, Principal Planner, Director of Urban Mobility and Development at AECOM, and a member of the Board of Directors for the Green Parking Council.

"There are approximately 250 million registered vehicles (2010) in the United States. When these vehicles are not in use, which accounts for more than 90 percent of their time, they must be parked. Because of this, off-street parking space availability is ubiquitous; its footprint is vast in scale. As MIT Professor of Landscape Architecture and Planning Eran Ben-Joseph recently noted, in some U.S. cities, parking lots cover more than a third of the land area, becoming the single most salient landscape feature of our built environment. This ubiquity is further compounded because cities require parking everywhere, yet ironically its absence is noticed most."

"The ubiquity of parking is not accidental: Parking matters. It plays an important role in the success of cities, communities and places as well as in the development of mixed-use projects and sustainable transportation. Parking supply and pricing often have a direct impact on the ability to create compact, healthy communities. Too much parking at residential properties correlates with more automobile ownership, more vehicle miles traveled, more congestion, more carbon emissions, and higher housing costs. It also results in lost development opportunity because excess parking area could have been used instead for residential or commercial development or public realm uses such as parks and plazas."

Parking also has direct and indirect environmental consequences. Direct environmental impacts include excessive land consumption, increased storm water flows, degraded water quality, and exacerbated heat island effects. Additionally, parking structures themselves use substantial amounts of natural resources and energy to construct and require ongoing maintenance to operate. In many cases, parking structures are seen as unsightly when they are not internalized in mixed-use buildings or wrapped by liner buildings. Parking also indirectly affects the environment because it influences how and where people choose to travel. Where free and ample parking is provided, people make the rational choice to drive almost everywhere — and these areas register more vehicle miles of travel per capita with resulting increases in greenhouse gases and other pollutants.

Striking a balance between parking supply and development is a crucial challenge in developing the character of urban environments and transit-oriented development (TOD) areas. Residents in urban environments and TOD projects are twice as likely not to own a car as other US households. They're also two to five times more likely to commute by transit than others in the region. On the other hand, residents will need access to cars even if not daily and commercial establishments require some amount of parking to service their non-walking clientele. In many cases, developers will be unable to secure financing unless parking is provided.

Unfortunately, many communities have simply applied conventional parking ratios to urban environments and TOD projects. Because such standards have a suburban bias and are based largely on low-density single land uses, they limit the expected community benefits of TOD, and possibly, lead to project failure.

Transit Oriented Development (and urban environments in general) include four foundational elements:

- Development around transit that is dense and compact, at least relative to its surroundings;
- A rich mix of land uses—housing, work, and other destinations, creating a lively place and balancing peak transit flows;
- A great public realm—sidewalks, plazas, bike paths, a street grid that fits, and buildings that address the street at ground level; and
- A new deal on parking—less of it; shared wherever possible; energy efficient and designed properly.

Right sizing parking for urban environments and TODs necessitates a multipronged approach to understanding the existing and projected parking utilization and available supply in and around the project areas as well as the projected demand for new parking once the project is completed. Conducting a diagnostic parking study that is comprehensive and aligned with mobility choices is essential to this effort. Once the facts about demand, price, utilization, built form/development pattern, and household characteristics are understood, then appropriate strategies can be employed.

Key elements include understanding differences among markets, unbundling or separating the full cost of parking from the associated use, and reducing (or eliminating) minimum parking requirements for certain land uses or certain areas. Understanding the parking uses by market and type then make it possible to look for opportunities for implementation of a wide range of measures from new technology (e.g., smart parking), to specific policies and physical design modification to consolidate and locate parking more efficiently.

To ensure that parking meets the needs of an urban environment or TOD project, while not impacting the TOD's benefits, there are several strategies that municipalities can employ working in conjunction with developers to provide the appropriate amount of parking. These strategies can be grouped into several categories, including reduction; demand; design; and pricing. Each of these categories is discussed briefly below.

Reduction

Given the research, along with the information developed by a parking supply and demand study, municipalities should make every effort to reduce the parking requirements for TOD projects. Eliminating parking minimums and instead employing parking maximums for TOD projects will help decrease parking oversupply. Similarly, requiring shared parking where multiple developers combine parking needs into one shared parking lot or structure may also help eliminate an oversupply of parking.

Demand

Reducing the need for car travel is critical to decreasing parking demand. Municipalities or developers should consider establishing car sharing programs where multiple users have access to a fleet of cars when they need them. Similarly, municipalities and transit agencies could increase incentives for using public transportation, including providing subsidized transit passes, establishing residential parking programs for adjacent neighborhoods backed by parking enforcement, and constructing bicycle parking facilities.

Design

Designing for pedestrians is an important element to right-sizing parking. This requires reducing or eliminating design elements that hamper pedestrian use such as the number and size of curb cuts. It also requires adding elements that provide for greater pedestrian safety and aesthetic appeal. These elements might include constructing pedestrian walkways separated from parking and roads, wrapping parking behind existing buildings, designing the first level of parking structures to include other uses such as stores and restaurants, and adding public amenities like art space or public plazas which incorporate green infrastructure.

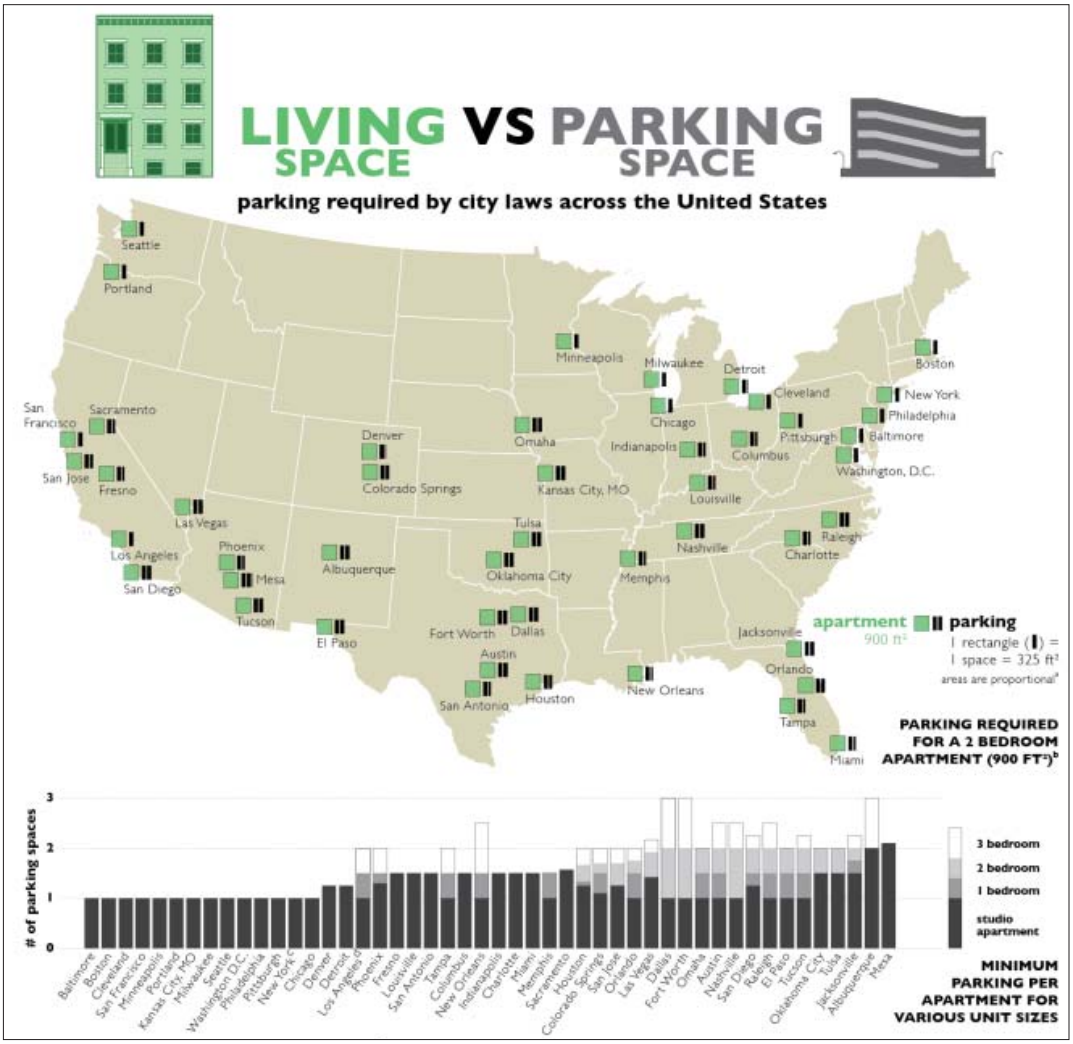
Pricing

Pricing is another strategy that can be used to influence how and where parking is used and located within a transit station area. On-street parking can be priced to encourage availability of on-street spots for preferred populations such as short term customers. In this case, the cost of parking for 15 or 30 minutes near shops located in the transit station area might be minimal while parking prices for more than 30 minutes is set quite high. Another strategy is to price parking to reflect parking desirability, i.e., spaces closest to activity hubs and on-street are priced higher than spaces at the downtown fringe and parking garages.

While increasing transit ridership, walking and biking are essential to establishing sustainable and livable communities, the car will continue as the principle mobility choice for years to come. Given this circumstance, municipalities and developers will still have to provide parking for urban environments and TOD projects and the surrounding area, but should do so in a way that is appropriately sized and located.

A Growing Interest in Parking Requirement Reform

In the graphic to the right, architect and designer Seth Goodman shows how parking and living spaces compare in major cities across the U.S. A more localized version of this research concentrated on the Northwest US is available, as is research on other land uses compared to parking spaces.



The research that focused on the Northwest US challenges the common assumption that smaller cities behave more like suburbs in terms of parking requirements. It's a mixed bag. Spokane, Washington and Eugene, Oregon all mimic the requirements of larger cities. Raleigh is another good example of this. We should not take for granted that a relatively small population (around 200,000 in the city proper) automatically translates to higher parking requirements. These examples demonstrate that cities don't need Manhattan-like conditions to ease up on parking minimums.

In Auckland, New Zealand, their City Council is debating whether to include traditional parking minimum requirements as an element of their Unitary Plan (comparable to City Comprehensive Plans in the US). The advertisement to the right illustrates how some advocacy groups are trying to influence the debate.

In the following pages, we examine the origins of parking requirements, the impediments to change, and how these policies can be reformed

The Case for and the Case Against Reforming Parking Requirements

Background on Traditional Minimum Parking Requirements

According to research published by professors Donald Shoup, Richard Willson, and others, in many instances, efforts to accommodate parking have overextended actual need. The approach used by many cities to establish minimum parking requirements typically is a generic formula based on satisfying the maximum demand for free parking. Although this practice allows city planners to err on the side of caution, it has some serious drawbacks. In practical terms, this practice increases the development cost and creates disincentives with respect to smart growth development and redevelopment. In addition, generic parking requirements create excess parking spaces that consume land and resources, encourage automobile use and associated pollution, and degrade water quality. The oversupply of parking is of concern for smart growth development in urban areas where the existing parking infrastructure can be better utilized and parking alternatives, such as shared parking and increased use of transit and pedestrian modes, can be more readily implemented.

With the shifting trend toward urban revitalization over the past decade, the timing is opportune for instituting changes in parking requirements and transportation behavior. An important way to reduce the demand for parking and the need to supply parking to meet maximum demand is to provide transportation choices. This can be achieved by reducing the supply of parking in areas where transportation choices exist and by providing incentives for making other choices. Such changes will encourage infill redevelopment and reduce vehicle miles traveled, mobile source emissions and congestion. They also will increase ridership for public transit and, in turn, provide the additional revenues needed to support public transit improvements.

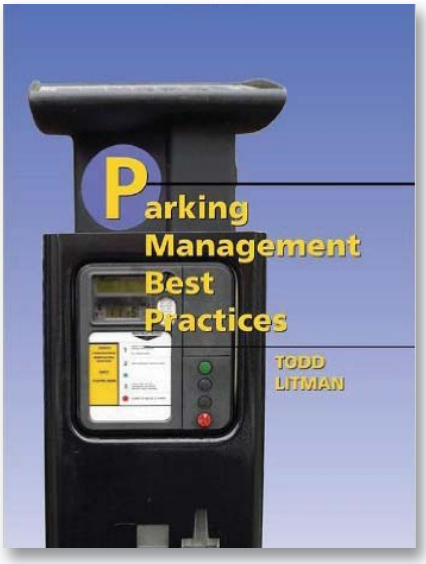
There are, of course, potential drawbacks to reducing the supply of parking. Lenders, for example, may be unwilling to approve loans because plans do not meet their minimum parking requirements; developers may be concerned about the long-term marketability of their property; and residents may fear that parking will spill over into surrounding residential neighborhoods. Such concerns can be more readily addressed if:

- The factors that affect parking demand are understood;
- Walkable, pedestrian-oriented development design is implemented; and
- Viable transportation choices exist.

Concerns also are alleviated when developers, employers, and employees are aware of programs that balance the attractiveness of other transportation choices. The Transportation Equity Act for the 21st Century (TEA-21), for example, allows businesses to give their employees up to $100 per month in tax free transit subsidies. TEA-21 also allows employees who commute by public transit or vanpool to deduct the cost of commuting from their taxable income if they do not receive a subsidy.

Establishing Parking Requirements

On the Victoria Transport Policy Institute (VTPI) website and in his book on parking management, noted planner and transportation consultant Todd Litman does a good job of laying out the traditional approach to establishing parking requirements and makes a strong case for the use of more flexible and localized criteria in creating zoning codes especially as it relates to parking requirements.



In setting parking requirements, planners typically use generic standards that apply to general land use categories (e.g., residential, office, retail). Such standards have been developed and published by professional organizations, including the Institute of Transportation Engineers (ITE), based on experience in many locations. Much of the data on which these standards are based comes from low-density, single-use developments with limited transportation choices. Therefore, the generic parking rates cannot consider the mix of context-sensitive, community specific variables—density, demographics, availability of transportation choices, or the surrounding land-use mix—all of which influence the demand for parking and should be reflected in parking requirements.

Instead, requirements are based on the maximum demand for parking, when parking is provided at no charge to users, and walking, biking, and transit are not available choices. This formula yields a surplus of parking that is costly for developers to provide, and it subsidizes personal automobile use and encourages auto use even in areas where convenient transportation choices exist. Because of the way in which they are typically established, parking requirements are remarkably consistent across different cities, despite varying levels of economic vitality, population size, and development density.

Alternatively, parking requirements can be established using methods that are better tailored to specific development projects.

This approach entails careful consideration of the following land use characteristics that relate to parking demand:

- Development type and size.
  - Considers the specific characteristics of the project.
  - Parking demand is influenced by the size of the development (typically measured by total building square footage), as well as the type of land use (e.g., retail, industrial). Generic parking formulas address these factors to some extent.
- Population and development density.
  - Considers the density and demographic characteristics of the people using the building, including employees, customers, residents, and visitors. Information on income, car ownership, and age distribution also helps in projecting total parking demand.
- Availability of transportation choices.
  - Considers the modes of transportation available to employees, visitors, and residents. Proximity of public transportation to a development, for example, will reduce parking demand.
  - Walkable neighborhoods and bicycle amenities will also reduce parking demand.
- Surrounding land use mix.
  - Considers the surrounding land uses and density to better understand parking needs, and evaluates whether overall peak demand is lower than the sum of peak demands for different uses. This concept takes the timing of parking demand into account in determining the aggregate demand of multiple uses.
  - The type of community in which a development is located will also affect parking demand. For example, if a project is in a city's central business district, the availability of general use parking will reduce onsite parking demand. On the other hand, if the development is in a residential area, on-street parking may be unacceptable to residents, increasing the need for off-street parking at the development.

Land use and demographic information are important tools for establishing project-specific parking requirements that create a better match of supply and demand for parking than do many generic requirements.

Moreover, adjusting parking requirements downward to reflect realistic demand helps reduce the total cost of development, particularly in urban areas. By reducing cost, a potential deterrent to smart growth development and redevelopment can be removed.

The following table from the VTPI website summarizes a wide range of parking management strategies and indicates typical reductions in the amount of parking required at a destination, and whether a strategy helps reduce vehicular traffic, therefore providing congestion, accident and pollution reduction benefits.

Strategy	Description	Typical Reduction	Traffic Reduction
Shared Parking	Parking spaces serve multiple users and destinations.	10-30%	
Parking Regulations	Regulations favor higher-value uses such as service vehicles, deliveries, customers, quick errands, and people with special needs.	10-30%	
More Accurate and Flexible Standards	Adjust parking standards to more accurately reflect demand in a situation.	10-30%	
Parking Maximums	Establish maximum parking standards.	10-30%	
Remote Parking	Provide off-site or urban fringe parking facilities.	10-30%	
Smart Growth	Encourage more compact, mixed, multi-modal development to allow more parking sharing and use of alternative modes.	10-30%	●
Walking and Cycling Improvements	Improve walking and cycling conditions to expand the range of destinations serviced by a parking facility.	5-15%	●
Increase Capacity of Existing Facilities	Increase parking supply by using otherwise wasted space, smaller stalls, car stackers and valet parking.	5-15%	●
Mobility Management	Encourage more efficient travel patterns, including changes in mode, timing, destination and vehicle trip frequency.	10-30%	●
Parking Pricing	Charge motorists directly and efficiently for using parking facilities.	10-30%	●
Improve Pricing Methods	Use better charging techniques to make pricing more convenient and cost effective.	Varies	●
Financial Incentives	Provide financial incentives to shift mode, such as cash out.	10-30%	●
Unbundle Parking	Rent or sell parking facilities separately from building space.	10-30%	●
Parking Tax Reform	Change tax policies to support parking management objectives.	5-15%	●
Bicycle Facilities	Provide bicycle storage and changing facilities.	5-15%	●
Improve User Information and Marketing	Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication.	5-15%	●
Improve Enforcement	Insure that parking regulation enforcement is efficient, considerate and fair.	Varies	
Transportation Management Associations	Establish member-controlled organizations that provide transport and parking management services in a area.	Varies	●
Overflow Parking Plans	Establish plans to manage occasional peak parking demands.	Varies	
Address Spillover Problems	Use management, enforcement and pricing to address spillover problems.	Varies	
Parking Facility Design and Operation	Improve parking facility design and operations to help solve problems and support parking management.	Varies	

Environmental Impacts of Parking

The significant environmental costs associated with parking typically are not factored into development decisions, and only recently have begun to be considered in setting parking requirements. Construction of unnecessary impervious surfaces increases the impacts of storm water runoff, either on the storm sewer system or the surrounding land. Paved surfaces can also result in water pollution and flooding, resulting in a decline in adjacent property values. Heat islands, or areas of artificially raised temperatures, also are exacerbated by unnecessary pavement.

Consuming land for parking also reduces the land available for green space or other, more productive development. Land preserved as part of the green infrastructure allows storm water to percolate into the soil, provides wildlife habitat, provides air quality and noise reduction benefits, and is aesthetically desirable. Land developed for living, working, and shopping rather than just parking provides more intensive use. This lowers the demand to develop other land nearby or elsewhere in the region. Intensifying uses also creates a more supportive environment for transit and walking, and potentially for bicycling as well.

Providing more parking than demanded, and at artificially low prices, contributes to several harmful environmental impacts. First, this subsidy of automobile use leads directly to excess driving. This results in increased auto dependency and air pollution, accidents, and congestion. Second, it indirectly degrades the attractiveness of walking and biking, by increasing distances between activities and creating uninteresting routes.

Third, it indirectly undermines the potential for transit service by decreasing the density potential of development projects.

These environmental costs tend to be greater for parking built in green field areas where there is more inexpensive but ecologically-sensitive open space available and where development densities are lower thus requiring more and longer automobile trips. Because these environmental costs are not realized by developers, they do not influence development decisions which are driven primarily by the direct financial costs that are typically lower in green field areas.

Parking Requirement Reform

The following is an excerpt from the book Parking Reform Made Easy by Richard Wilson. Richard W. Willson, Ph.D., FAICP, is Professor and Chair in the Department of Urban and Regional Planning at California State Polytechnic University, Pomona.

Parking requirements in zoning ordinances create one of the most wasteful elements of transportation and land use systems: unoccupied parking spaces. Each space requires more than 300 square feet of valuable land or building area, yet many sit empty. Minimum parking requirements at shopping malls, for example, often lead to sprawling developments surrounded by large, underused parking lots. Spaces for workplaces may be well-used during the day but remain unoccupied in the evening because they are not shared with other land uses.

Sometimes, the parking required is greater than the amount of parking ever used. Parking is overbuilt and underutilized for two reasons: 1) zoning requires an excessive parking supply, and 2) it prevents efficient sharing of parking among different land uses. Both reasons reflect a legacy of single-use zoning and an automobile-first approach to planning. Minimum parking requirements prevent private developers from responding to market conditions, and lessen developers' interest in sharing parking or developing sites that are accessible without driving. Planners sometimes claim that developers would build the same amount of parking regardless of regulations, but if that's true, then why impose minimum parking requirements in the first place?

Parking requirements should be framed as a means of providing access, not an end. Parking requirements are only one of several ways to ensure storage for private automobiles. Private auto transportation, in turn, is only one of several ways to provide access. To carry out parking reform, we must counteract the decades-old practice of thinking about access in terms of roadways and parking.

Why Parking Requirements?

Early zoning ordinances did not have parking requirements. Zoning sought to manage the external impacts of properties, such as when a new building represented a fire hazard to the structure next door. In the mid-20th century, parking requirements were added to address surface street congestion caused by patrons driving in search of parking. Planners didn't foresee that minimum parking requirements would favor private vehicle travel, lower overall density, and increase traffic.

In surveys conducted in 1995 and again in 2013, local planners in southern California were asked about parking requirements and found a repetitious justification for minimum parking requirements: planners wished to ensure an adequate number of parking spaces. This response reflects a lack of critical thinking about fundamental public objectives, such as accessibility, economic development, and sustainability. The response also reflects an outdated vision of separated land uses, unrestricted auto-mobility, and plentiful free parking. Thus, many parking requirements are relics that undermine current land use and transportation goals.

The following tables from Richard Willson's book summarize the cases both for and against minimum parking requirements.

The Case FOR Parking Minimum Requirements
• Reduce street congestion around the development site
• Avoid parking spillover
• Create orderly development patterns
• Anticipate possible intensification or changes in the use of a development
• Create a level playing field among developers
• Encourage growth of core areas by increasing parking supply in those areas
• Reduce parking management by making the adjudication of conflicts between property owners unnecessary

The Case AGAINST Parking Minimum Requirements
• Encourages private vehicle usage and lengthens trips
• Adversely impacts transit and alternative modes
• Reduces development density
• Creates inhospitable project design
• Thwarts development and economic activity (little or no direct revenue)
• Makes construction of affordable housing more challenging
• Hampers investment in infill development and adaptive reuse in core areas

Why Change Is Difficult

Some regional and state policymakers recognize that existing parking requirements are excessive, but most have neglected the issue because parking is a responsibility of local governments. Yet parking requirements are crucial to accomplishing federal, state, and regional objectives in transportation, land use, and the environment. There are recent indications that if local governments do not carry out reforms, states may do it for them. In 2012, a proposal in the California legislature (AB 904) sought to override local parking requirements in transit-rich areas. Legislators subsequently tabled the proposal, however, showing the power of local governments to resist state interference in parking policies.

Many local planners know the parking requirement status quo is wrong. They have observed wasted land, turned away restaurant proposals in historic districts, and seen affordable housing not pencil out. Despite these undesirable outcomes, planners have not made changes. Why? Some may feel powerless to change ossified regulations, sensing weak political support and lacking technical expertise to justify changes. Others may want the negotiating leverage that excessive parking requirements provide to extract public benefits from developers. Furthermore, planners know that parking is a key point in NIMBY (not-in-my-back-yard) resistance to development, so avoiding parking controversy can help ensure economic development. In effect, cities are addicted to parking requirements. The addiction is analogous to smoking, where immediate gratification overwhelms future costs.

Change means freeing ourselves of parking dogma, habits, and golden rules. The old reality dictated fixed parking requirement ratios and exhibited an unwillingness to deviate from standard practice, even when it made sense to do so. This approach emphasized precision and uniformity. It undervalues important considerations of local variability, policy relationships, environmental capacity, and human behavior. All the land-use plans, design reviews, and streetscape renderings in the world will not produce desired outcomes if we do not reform parking requirements.

Why Not Eliminate Parking Requirements?

According to national experts, deregulating off-street parking allows markets to determine parking supply levels and provokes a fresh debate about justifications for public regulations and subsidies for all transportation modes. Currently, minimum requirements compel the provision of access for driving and parking, whereas zoning codes seldom impose equivalent requirements for bus, bicycle, or pedestrian facilities. When they do, those requirements have been added more recently and are at a lower investment level.

Under minimum requirements, even those who do not drive share in paying the cost of parking. Parking costs are embedded in higher retail prices, lower workplace salaries, higher rents, and the like. In these ways, most minimum requirements tend to prioritize private vehicles. Eliminating minimum requirements would begin to level the playing field for all travel modes.

Cities such as Philadelphia, Portland, and Seattle have recently reformed their parking requirements and adopted limited deregulation. Deregulation shifts the approach from automatically requiring parking to not supplying it until it is economically justified. It is a big change from standard practice and should be coupled with programs for shared parking and advanced parking management. Still, the idea of eliminating minimum parking requirements hasn't gained traction in many places. Local officials often are buffeted by demands from residents, storeowners, and employees for more parking, not less.

- City staff researched TOD parking requirements in several other communities including the following:
- Denver Zoning Code: Maximum number of spaces shall not exceed 110% of the minimum parking spaces required by context-specific ratios (Denver's method of calculating parking requirements everywhere.) Parking in structures doesn't count toward the maximums.
- Aurora TOD Zoning Sub-District: Minimum 0.5 – 1.0 space per multi-family dwelling unit depending on proximity to a transit station compared to 1.0 – 2.5 spaces per unit depending on number of bedrooms outside TOD.
- Lakewood Transit Mixed Use Zone District: Minimum 1 space per unit, maximum 2 spaces per unit. Parking in structures doesn't count toward the maximums. The parking requirements may be met on-site or off-site at up to 600 feet from the use.
- Eugene, Oregon: Establishes parking exempt areas not subject to minimums including Downtown and a couple other areas.
- Metro Portland recommends three actions when the parking ratio is below 1.0 space/unit:
  - Charge for all covered parking
  - Add car-share in the area
  - Provide first rate bicycle facilities (lockers, wash areas, secured bike parking, etc.)

Examples of progressive parking requirements from additional communities are reviewed later in this report (See Peer Cities section).

Developers' Responses to Different Approaches to Parking Requirements

Approaches to parking reform vary from community to community. Accordingly, the table below shows the range of reform options, including the traditional approach in which the minimum requirements exceed expected use. At the other end of the spectrum is deregulation, with no minimum or maximum parking requirements. In many cities and towns, the best approach is somewhere in between, with deregulation in central business districts and transit-oriented developments, and reduced minimum requirements in other areas.

Developers' Responses to Parking Requirements

Approach	Minimum Requirement	Maximum Requirement	Developer Response
Traditional	> Utilization	None	Rarely builds more that the requirement
Moderate Reform	= Utilization	None	Assesses market for project, may exceed the minimum
Big City Approach	< Utilization	A fixed ratio or percentage of minimum	Makes market decision whether to supply the minimum or build to the maximum
Partial Deregulation	None	A fixed ratio	Makes market decision whether to supply any parking or build to the maximum
Deregulation	None	None	Makes the market decision whether/how much to build

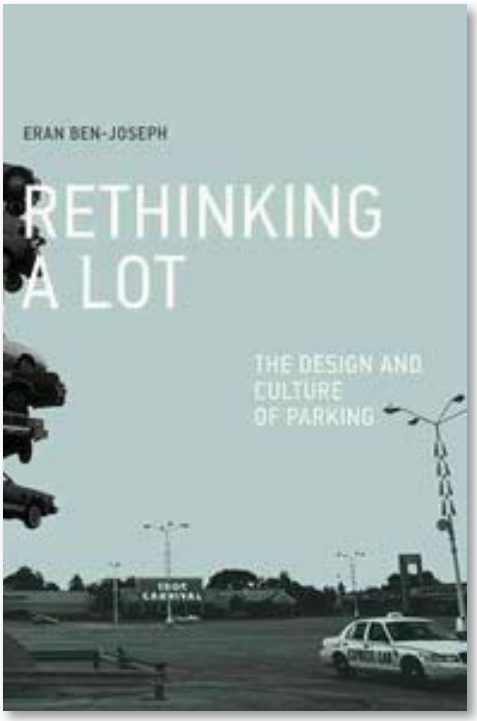
In Praise of Incrementalism

According to Richard Willson, in the past decade, many cities initiated comprehensive zoning code reform, and others are planning such efforts. Comprehensive reform efforts allow planners to rethink parking requirements while they consider the basic organization and functioning of the zoning code. These efforts also allow planners to bypass the complexity of older codes that have undergone countless revisions. Ideally, planners will amass enough political clout and financial resources before undertaking the daunting task of comprehensive zoning code revision.

There are many situations, however, where financial resources and political capital are not sufficient for comprehensive parking reform. In these cases, an incremental approach can produce good results. It makes sense to start where there is support, either from elected officials or from community or district stakeholders. Code reformers can work with these stakeholders and produce parking requirement reforms, parking overlay zones, or partial deregulation without creating opposition that might emerge in a citywide effort.

These early successes often build support for larger, more comprehensive efforts. Rather than viewing pilot projects or experiments as somehow inferior to comprehensive parking reform, we should see them as effective ways of producing valuable information, testing innovative ideas, and ultimately generating change.

Rethinking Parking — Another Perspective on the Potential of Parking Lots



In his 2012 book, *Rethinking a Lot: The Design and Culture of Parking*, Eran Ben-Joseph, professor of landscape architecture and urban planning at the Massachusetts Institute of Technology, argues that parking lots are so prevalent in our daily life that we should take them more seriously.

There are an estimated 600,000,000 passenger cars in the world, and that number is increasing every day. So too is Earth's supply of parking spaces. In some cities, parking lots cover more than one-third of the metropolitan footprint. It's official: we have paved paradise and put up a parking lot. In Rethinking A Lot, Eran Ben-Joseph shares a different vision for parking's future. Parking lots, he writes, are ripe for transformation. After all, as he points out, their design and function has not been rethought since the 1950s. With this book, Ben-Joseph pushes the parking lot into the twenty-first century.

Can't parking lots be aesthetically pleasing, environmentally and architecturally responsible? Used for something other than car storage? Ben-Joseph shows us that they can. He provides a visual history of this often ignored urban space, introducing us to some of many alternative and non-parking purposes that parking lots have served - from RV campgrounds to stages for "Shakespeare in the Parking Lot." He shows us parking lots that are not concrete wastelands but lushly planted with trees and flowers and beautifully integrated with the rest of the built environment. With purposeful design, Ben-Joseph argues, parking lots could be significant public places, contributing as much to their communities as great boulevards, parks, or plazas. For all the acreage, they cover, parking lots have received scant attention. It's time to change that; it's time to rethink the lot.

The parking lot is the antithesis of nature's fields and forests, an ugly reminder of the costs of our automobile-oriented society. But as long as we prefer to get around by car (whether powered by fossil fuel, solar energy or hydrogen), the parking lot is here to stay.

It's hard to imagine an alternative. Or is it? I believe that the modern surface parking lot is ripe for transformation. Few of us spend much time thinking about parking beyond availability and convenience. But parking lots are, in fact, much more than spots to temporarily store cars: they are public spaces that have major impacts on the design of our cities and suburbs, on the natural environment and on the rhythms of daily life. We need to redefine what we mean by parking lot to include something that not only allows a driver to park his car, but also offers a variety

of other public uses, mitigates its effect on the environment and gives greater consideration to aesthetics and architectural context.

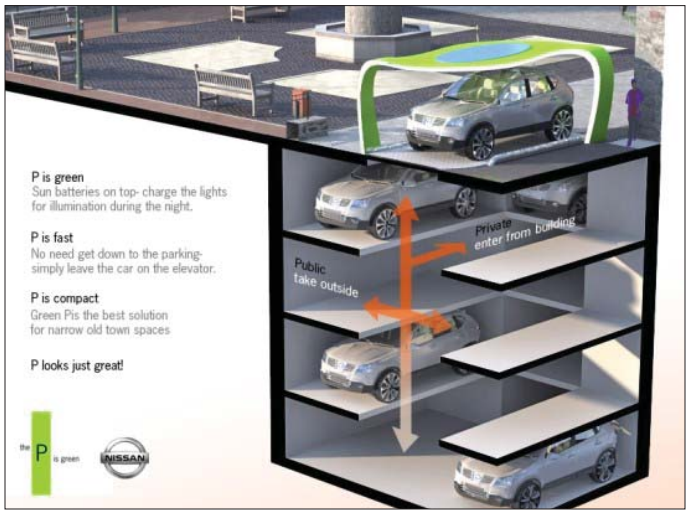
It's estimated that there are three nonresidential parking spaces for every car in the United States. That adds up to almost 800 million parking spaces, covering about 4,360 square miles—an area larger than Puerto Rico. In some cities, like Orlando and Los Angeles, parking lots are estimated to cover at least one-third of the land area, making them one of the most salient landscape features of the built world.

Such coverage comes with environmental costs. The large, impervious surfaces of parking lots increase storm-water runoff, which damages watersheds. The exposed pavement increases the heat-island effect, by which urban regions are made warmer than surrounding rural areas. Since cars are immobile 95 percent of the time, you could plausibly argue that a Prius and a Hummer have much the same environmental impact: both occupy the same 9-by-18-foot rectangle of paved space.

A better parking lot might be covered with solar canopies so that it could produce energy while lowering heat. Or perhaps it would be surfaced with a permeable material like porous asphalt and planted with trees in rows like an apple orchard, so that it could sequester carbon and clean contaminated runoff.

The ubiquity of parking lots has also led to an overlooked social dimension: In the United States, parking lots may be the most regularly used outdoor space. They are public places that people interact with and use daily, whether working, shopping, running errands, eating, even walking—parking lots are one of the few places where cars and pedestrians coexist.

Better parking lots would embrace and expand this role. Already, many lots provide space for farmers' markets, spontaneous games of street hockey, tailgating, even teenagers' illicit nighttime parties. This range of activities suggests that parking lots are a "found" place: they satisfy needs that are not yet met by our designed surroundings. Planned with greater intent, parking lots could become significant public spaces, contributing as much to their communities as great boulevards, parks or plazas. For instance, the Italian architect Renzo Piano, when



redesigning the Fiat Lingotto factory in Turin, eliminated the parking lot's islands and curbs and planted rows of trees in a dense grid, creating an open, level space under a soft canopy of foliage that welcomes pedestrians as naturally as it does cars.

The parking lot also has an underutilized architectural function. A parking lot is the first part of a space you visit or live next to. It is typically the gateway through which dwellers, customers, visitors or employees pass before they enter a building. Architects and designers often discuss the importance of "the approach" as establishing the tone for a place, as the setting for the architecture itself. Developers talk about the importance of "first impressions" to the overall atmosphere conveyed to the user.

Yet parking lots are rarely designed with this function in mind. When they are, the effect is stunning. For instance, the parking lot at the Dia art museum in Beacon, N.Y., created by the artist Robert Irwin and the architecture firm OpenOffice, was planned as an integral element of the visitor's arrival experience, with an aesthetically deft progression from the entry road to the parking lot to an allée that leads to the museum's lobby.

For something that occupies such a vast amount of land and is used daily by so many people, the parking lot should receive more attention than it has. We need to ask "what can a parking lot be?"

In Summary

The strategies and policy considerations discussed above are alternatives to setting a parking requirement based on a neighboring city's requirement or a national average. The City of Raleigh has long moved beyond most communities in this regard, however through this study we will be evaluating options to reassess parking requirements based on specific land use categories (for example applying differing standards to student housing-oriented projects compared to other multi-family housing developments based on the demonstrated differences in parking demand generated by this specific use). We also are assessing varying requirements based on development size or context features, such as transit accessibility, mixed-land uses, shared parking and overall development density. Alternative compliance mechanism use that provides more context-specific data from which to make rational and measured adjustments to parking requirements also are being assessed.

Parking reform also can be coordinated with regional planning and modeling activities. For example, in King County, Washington, the Metro Transit's web-based GIS tool provides data on parking utilization for multi-family housing and tests alternative parking ratios in terms of costs and impacts.

Note: More information about King County, Washington's King County Multi-Family Residential Parking Calculator can be found at http://www.rightsizeparking.org/.

In the case of Raleigh, the use of the Park+ parking demand modeling software that has been purchased by the City could provide a similar analysis tool.

BEST PRACTICES REVIEW

This following section summarizes some of the parking best management practices that are recommended and/or have been successfully implemented in other communities. These practices are tools to address existing parking issues and accommodate future demand. It is important to remember that these strategies are not mutually exclusive and may need to be modified to suit the needs of the City of Raleigh. Many of these strategies are complementary and are most effective when used in conjunction with one another.

Innovative Alternatives or Supplements to Minimum Parking Requirements

Some local governments have implemented alternatives to generic parking requirements that increase availability from existing supply, reduce the demand for parking, or create more cost-effective and environmentally sensitive parking structures that preserve pervious surfaces. By lowering total development costs, some of these parking alternatives have consequently encouraged smart growth development and redevelopment. This section summarizes proven alternatives and includes discussion of their establishment, advantages, and potential concerns. The alternatives are organized according to their influence on parking supply, parking demand and pricing.

Increasing Availability from Existing Supply or Limited Expansion

Frequently, the supply of parking in developed areas is sufficient to meet parking demand, but a combination of reasons limit the availability of that supply.

Context-Specific Minimum Requirements

Generic minimum requirements are typically set based on maximum observed demand for free parking in areas with no transportation choices. However, parking demand is determined by a range of factors that lead to significant variations within and across jurisdictions, meaning that a single standard for each land use may not be appropriate. Other factors that are strongly correlated with lower vehicle ownership in urban areas are frequent transit service, small household sizes, low incomes, a high proportion of seniors, and rental housing.

Similarly, at commercial developments, transit access, mix of uses, and density are good predictors of parking demand. Often developers are interested in finding ways to reduce the vehicle trip generation calculations for their expected development, so that they can demonstrate fewer impacts on the surrounding roadway network, while they may not always be so eager to reduce the amount of parking to supply.

A major challenge for cities is how to convert this research and data, together with experience from other settings, into local parking requirements or planning approvals for specific developments. Some of the mechanisms being used are:

- Transit Zoning Overlays
- New Zoning Districts or Specific Plans
- Parking Freezes
- Reductions for Affordable and Senior Housing
- Case-By-Case Evaluation
- Land Banking and Landscape Reserves

Maximum Limits and Transferable Parking Entitlements

In contrast to generic minimum parking requirements, maximum limits restrict the total number of spaces that can be constructed rather than establish a minimum number that must be provided. Planners set maximum limits much like they set minimum requirements. Typically, a maximum number of spaces is based on square footage of a specific land use. For example, the City of Portland, Oregon restricts offices in the central business district to 0.7 parking spaces per 1,000 square feet, and retail to 1.0 space per 1,000 square feet of net building area. Contrary to what might be expected, the maximum limits in Portland have not led to a parking shortage because of the balance of transportation choices available.

Maximum requirements are not ideal for all locations. It is crucial for municipalities that employ maximum requirements to have accompanying accessible and frequent public transportation. It is also important for the area to be sufficiently stable economically to attract tenants without needing to provide a surplus of parking. Several cities have implemented maximum parking requirements, including San Francisco, California; Portland, Oregon; and Seattle, Washington.

Shared Parking

Different types of land uses attract customers, workers, and visitors during different times of the day. Shared parking is another alternative that city planners can employ when setting parking requirements in mixed-use areas. An office that has peak parking demand during the daytime hours, for example, can share the same pool of parking spaces with a restaurant whose demand peaks in the evening. This alternative also reduces overall development costs.

By allowing for and encouraging shared parking, planners can decrease the total number of spaces required for mixed-

use developments or single-use developments in mixed-use areas. Developers benefit, not only from the decreased cost of development, but also from the "captive markets" stemming from mixed-use development. For example, office employees are a captive market for business lunches at restaurants in mixed-use developments.

Shared parking encourages use of large centralized parking facilities and discourages the development of many small facilities. This results in more efficient traffic flow because there are fewer curb cuts, and turning opportunities on main thoroughfares. This has the added benefits of reducing accidents and reducing emissions from idling vehicles stuck in traffic.

Establishing shared parking requirements involves site-specific assessment or use of time-of-day parking utilization curves. Montgomery County, Maryland allows for shared parking to meet minimum parking requirements when any land or building under the same ownership or under a joint use agreement is used for two or more purposes. The county uses the following method to determine shared requirements for mixed-use developments:

- Determine the minimum amount of parking required for each land use as though it were a separate use, by time period, considering proximity to transit.
- Calculate the total parking required across uses for each time period.
- Set the requirement at the maximum total across time periods.

Many available sources document procedures for calculating shared parking requirements, from 1983's "Flexible Parking Requirements" to 2003's SmartCode.

In-Lieu Parking Fees and Centralized Parking

Municipalities establish in-lieu parking fees as an alternative to requiring on-site parking spaces. With in-lieu fees, developers can circumvent constructing parking on-site by paying the city a fee. The city, in return, provides centralized, off-site parking that is available for use by the development's tenants and visitors. The fees are determined by the city and are generally based on the cost of providing parking. Cities set fees in one of two ways, either by calculating a flat fee for parking spaces not provided by a developer on-site or by establishing development-specific fees on a case-by-case basis. Shoup reports that in-lieu fees in the United States range from $5,850 to $20,180 per parking space. These fees can be imposed as a property tax surcharge.

In-lieu parking fees provide advantages to both planners and developers. Allowing developers to pay fees in-lieu of constructing parking has the following benefits:

- Overall construction costs may be reduced;
- Construction of awkward, unattractive on-site parking is avoided;
- Redevelopment projects involving historic buildings can avoid constructing parking that would compromise the character of the buildings;
- Planners can ensure that existing parking facilities will be more fully utilized; and
- Planners can encourage better urban design with continuous storefronts that are uninterrupted by parking lots.

In establishing in-lieu parking fees, planners must be cognizant of potential developers' concerns about the impact of a lack of on-site parking on the attractiveness of developments to tenants and visitors. This can be an issue if available public parking is insufficient, inconveniently located, or inefficiently operated. Planners must carefully consider the parking demand for each participating property and provide enough parking to meet this demand to avoid creating a perceived or real parking shortage. Planners must also work to ensure that public parking facilities are centrally located and operated efficiently.

Centralized parking facilities can reduce the costs of parking because large facilities are less expensive on a per space basis to build and maintain than small facilities. Centralized parking, as an alternative to on-site parking, also improves urban design and preserves the historic nature of communities. Some cities mandate centralized parking facilities and finance them through development impact fees in lieu parking fees or negotiated contributions established during the environmental review process.

Increasing Availability by Decreasing Demand

Demand reduction can be achieved through a variety of programs and policies that attempt to reduce the automobile transportation demand, and thus reduce the needed supply of parking. While these programs are typically developed by local governments, their success often depends on the commitment of businesses to implement them effectively.

Demand reduction programs include: car sharing, subsidies for transit, transit improvements, pedestrian and bicycle amenities, and vehicle trip reduction programs. When employers allow telecommuting and/or flexible work schedules that reduce commuting, demand is also reduced.

Car Sharing

Car sharing is a neighborhood-based, short-term vehicle rental service that makes cars available to people on a pay-per-use basis. Members have access to a common fleet of vehicles on

an as-needed basis, gaining most of the benefits of a private car without the costs and responsibilities of ownership. In programs with the most advanced technology, members simply reserve a car via telephone or the Internet, walk to the nearest lot, access the car using an electronic card, and drive off. They are billed at the end of the month.

In commercial developments, car-sharing can also be a useful tool to reduce parking demand. Employees can use a shared vehicle for errands and meetings during the day, allowing them to take transit, carpool, walk or bicycle to work. Car-sharing works best in compact, mixed-use neighborhoods, where firms with corporate memberships tend to use the vehicles during the day and residents use them in the evenings and on weekends.

As well as reduced parking demand, car-sharing brings a broad range of other benefits, including fewer vehicle trips, and improved mobility for low-income households who may not be able to afford to own a car. Formal car-sharing programs have been established in many cities including Boston, Massachusetts; Washington, DC; San Francisco, California; Oakland, California; Portland, Oregon; Seattle, Washington; and Boulder, Colorado. Many others are in the process of establishing operations. Alternatively, developers can provide shared vehicles themselves, or facilitate informal car-sharing among residents.

Improvements to Transit Service, Pricing, and Information

Transit subsidies can be provided by employers, by cities, or by residential property managers. In the case of employer-paid transit pass schemes, the employer pays the cost of employees' transit, converting the fixed cost for parking spaces into a variable cost for the public transportation subsidy. This fringe benefit for employees reduces the demand for parking at the workplace, which in turn reduces traffic, air pollution, and energy consumption. It also reduces the cost associated with providing parking, as transit subsidies are generally less expensive than providing parking.

Improvements to Pedestrian and Bicycle Service

Demand for parking can be reduced by providing pedestrian and bicycle amenities that make it easier and more pleasant for people to walk or bicycle rather than drive. These amenities and design changes can alleviate traffic congestion. Improving the walkability and pedestrian orientation of employment centers can address the increasingly common "drive to lunch" syndrome. For example, the auto-orientation of Tyson's Corner, Virginia has resulted in terrible traffic at lunch time because people cannot walk to eating establishments or to do errands.

Vehicle Trip Reduction Programs

Another direct form of demand reduction involves instituting vehicle trip reduction programs. Vehicle trip reduction programs combine several types of demand reduction components to meet explicit vehicle trip reduction goals.

Thus, instead of capping the number of parking spaces, local officials limit the number of vehicle miles traveled in a region. These types of programs attempt to decrease the number of trips by single occupancy vehicles (SOVs) and increase the use of a variety of commuting alternatives, including transit, carpooling, walking, and bicycling.

To increase the effectiveness of vehicle trip reduction programs, cities or employers can incorporate an assortment of complementary program elements to balance transportation choices. The following are some examples:

- Guaranteed ride home services that allow employees who use public transit to get a free ride home (e.g., via taxi) if they miss their bus or if they need to stay at work late.
- Company fleet cars that can be used for running errands during the workday (e.g., doctor appointments).
- Preferential and/or reserved parking for vanpools/carpools.
- Carpooling and/or vanpooling with ride matching service. Ride matching can facilitate the identification of people who live close to one another. This service can be accomplished by providing "ride boards" or by using an employee transportation coordinator.
- Cellular phones for car and vanpooling to facilitate timing of pickups.

There is little incentive for employers to implement vehicle trip reduction programs if they are not granted reductions in minimum parking requirements. They would not be able to realize the potential cost savings from providing less parking, but would simply be faced with many empty spaces. Several cities, such as South San Francisco, have acknowledged this through ordinances that reduce parking requirements for projects that include vehicle trip reduction programs.

Efficient Pricing

Although it is often provided at no charge to the user, parking is never free. Each space in a parking structure can cost upwards of $2,500 per year in maintenance, operations and the amortization of land and construction costs. Even on-street spaces incur maintenance costs and an opportunity cost in foregone land value. The cost of parking is generally subsumed into lease fees or sale prices for the sake of simplicity and

because that is the more traditional practice in real estate. However, providing anything for free or at highly subsidized rates encourages overuse and means that more parking spaces must be provided to achieve the same rate of availability. Charging users for parking is a market-based approach by which the true cost of parking can be passed through to parking users. If the fee charged to users of parking facilities is sufficient to cover construction, operation, and maintenance costs, it will likely cause some users to choose not to park. Even where there are few alternatives to driving, parking pricing can encourage employees to seek out carpooling partners. In addition to reducing the cost of parking provision, pricing strategies bring major environmental and congestion benefits, particularly since they tend to reduce peak-period vehicle trips the most.

Parking charges have been found to reduce employee vehicle trips, and thus daily parking demand, by between 7 percent and 30 percent or more, depending on factors such as the level of charges and the availability of alternatives to driving alone. Parking price elasticities generally range from –0.1 to –0.6, with the most common value being –0.3, meaning that each 1 percent rise in parking fees is accompanied by a 0.3 percent decrease in demand.

Cash-Out Programs

Cash-out programs provide alternatives to directly charging users for parking. Under such programs, employers offer employees the choice of free or subsidized parking, a transit/vanpool subsidy equal to the value of the parking (of which up to $100 is tax-free under current federal law), or a taxable carpool/walk/bike subsidy equal to the value of the parking.

Employees who opt for the non-parking subsidies are not eligible to receive free parking from the employer, and are responsible for their parking charges on days when they drive to work. The cost savings associated with cash-out payments depend on the amount of the payments. If the full cash equivalent is provided, this demand reduction program does not reduce the total costs of providing parking. However, employees may accept cash payments lower than the full equivalent of the parking subsidy. If partial cash payments are used, employers face lower overall transportation subsidy costs and employees still benefit.

Differential Pricing by Trip Type

Parking pricing can be used as a sensitive tool to prioritize some types of trips over others, according to their purpose and duration. It allows managers to cater for desirable trips, such as short-term shoppers, while discouraging undesirable commuter trips, which add to peak-hour congestion and occupy a parking space for an entire day. These pricing strategies allow the overall supply of parking to be minimized, while ensuring spaces are available for critical users. They can also alleviate pressure to provide more parking from retailers and businesses, who may be concerned that poor parking availability discourages shoppers. Examples include:

- Lower or zero rates for short-term parking encourage shopping trips, while proportionally higher rates for long-term parking discourage all-day commuter parking, freeing up spaces for customers. Short-term parking allows many people to use a single space over the course of a day, rather than a single commuter, and generates revenue for businesses and sales tax dollars for cities.
- Parking charges that are levied by the hour or day, with no discounts for monthly parking, remove the financial disincentive to take transit occasionally. There is no perverse incentive to drive every day to get your money's worth from the monthly parking pass.
- Parking charges at transit stations that only apply before a certain time (such as 9 or 10 am) encourage off-peak transit ridership where spare capacity is available, rather than contributing to crowding in the peak.

Residential Parking Pricing

Parking charges also can be introduced at residential developments, through separating or unbundling the cost of parking from rents or sale prices. Rather than being provided with a set number of spaces whether they need them or not, residents can choose how many spaces they wish to purchase or rent. An alternative to direct charges is to provide rent rebates or discounts to residents who own fewer vehicles and do not use their allocated parking spaces.

Parking Benefit Districts

Parking pricing strategies can also be implemented through Parking Benefit Districts. Under this concept, revenue from meters and residential permits is returned to local neighborhoods. Once administrative costs are covered, all money goes to transportation and neighborhood improvements such as undergrounding of utility wires. Parking Benefit Districts allow developments to be built with less parking, while addressing potential spillover problems through market pricing of curb parking.

Earmarking revenue to directly benefit the neighborhood or commercial district helps to generate support for charges from residents and businesses, which might otherwise resist charging for parking that used to be free. Cities such as San Diego and Pasadena, California, have implemented Parking Benefit Districts in their downtown business districts, using parking meter revenue.

PEER CITY REVIEWS

In our research related to peer city parking requirements, we applied two primary criteria: communities of similar size or characteristics to Raleigh or communities with progressive parking planning policies similar in values to Raleigh. We identified five primary communities that met these criteria. These communities include:

- Ann Arbor, Michigan
- Berkeley, CA
- Portland, OR
- Eugene, OR
- Arlington County, VA

A summary of the key elements of each of these city's policies are provided below. More detailed information for each community is provided in Appendix B. Appendix B contains selected examples of well-developed or progressive zoning codes including some not on the Peer Cities list noted above.

City of Ann Arbor, Michigan

- City's web page: www.a2gov.org
- Downtown Development Authority web page: www.a2dda.org
- Commuting programs and services web page: www.getdowntown.org

Key Policies and Initiatives

- GetDowntown Program — This is a commuter service and assistance program. It offers commuting programs and services to employees and employers in downtown Ann Arbor. Programs and services include the go!pass, Commuter Challenge, Bike Locker Rentals, Zipcars, free commuting assistance, and commuting materials.
- Go! Pass Program — It is an employee benefit which offers unlimited rides on the City buses with in Downtown Development Authority's (DDA) boundaries. Additionally, this program offers discounts for other commuter services and at downtown businesses.
- Commuter Challenge — It offers prizes for trying alternative modes of transportation. The modes include busing, biking, walking, carpooling, and van pooling. The program is offered only for the month of May.
- Bike Locker Rental — Locker rentals are offered at $60/month. The rentals are offered from April 1 to March 31. The fee is prorated if the rental starts after April. Monthly rentals are not available.
- To encourage alternative modes of transportation, the parking demand for office buildings were dropped from 4 to 3 per 1,000 square feet.
- Maximum parking demand ratio was implemented for many land uses.
- For downtown projects, developers are not required to provide parking for up to 400% of FAR.
- For some mixed-use land uses, 700% of FAR is allowed and parking is required for FAR above 400%.
- Bicycle parking is required for many land uses.
- Outside bicycle parking spaces can be used for meeting "useable open space" requirements.
- Areas for inside bicycle parking spaces are not included in calculating the vehicular parking requirements.
- Up to 30% of parking supply could be designed for compact cars only.

Arlington County, Virginia

- Arlington County web page: www.arlingtonva.us
- Commuter Service web page: www.commuterpage.com
- Mobility Lab: http://mobilitylab.org/

Key Policies and Initiatives

- Office parking requirement is 1 space per 580sf (with associated apartment use), which is significantly less than the national average. Without apartment use, the requirement is 1/530sf.
- Hotel parking requirement is 0.7 per room. Again, significantly less than national average.
- Underground parking is encouraged.
- Parking requirements for Medical Office Buildings could be reduced by 10%.
- Parking requirements are reduced if approved shared parking programs are implemented.
- Parking is not required for the first 5,000sf of development (some land uses are excluded). For grocery stores, first 15,000sf is exempt, if the grocery store is not the principal land use.
- Office parking requirements could be reduced by up to 10%.
- 100% of required parking could be provided up to ¼-mile away.

- Reduced parking demand with approved TDM programs.
- Up to 15% of parking supply could be designed for compact cars only.
- Maximum parking requirements for many land uses.
- Parking near metro stations is not required if the development is located within 1,000 feet (with some exemptions).
- Mobility Lab is one of the most aggressive and successful transportation alternative programs in the country and is a recommended model for Raleigh to review.

City of Berkeley, California

- City's web page: www.ci.berkeley.ca.us
- Commuter Service web page: www.ci.berkeley.ca.us/commute

Key Policies and Initiatives

- The City offers many commuter programs. These include:
  - The Tax Relief Action to Cut Commuter Carbon (TRACC)
  - Commuter Benefit Services for Employers
  - The City requires that employers with ten or more employees provide a commute program to encourage employees to use public transit, vanpools or bicycles. TRACCC, gives employers several options - businesses can offer their employees commuter tax benefits as a payroll deduction, provide a subsidized benefit, or offer a combination of the two.
- Commute Programs
  - Guaranteed Ride Home Program
  - Ride matching for carpools and vanpools
  - Transportation Programs at UC Berkeley
- Transit Information Services
  - 511 Transit Information
  - Getting There on Transit
  - Clipper, the Bay Area's Smart Card for Transit
- AC Transit Local and Transbay Bus Service
  - Other Bus Services in Berkeley
  - Paratransit Services
  - Rail Service in Berkeley
  - Bay Area Rapid Transit (BART)
  - Capitol Corridor (train service from San Jose to Sacramento)
  - Connecting AMTRAK passenger rail services
- Car Sharing
- Parking can be provided up to 300 feet away from the development.
- Joint-use, off-street parking is allowed if there are no substantial conflicts.
- Transit Service Fee (TSF) is collected to provide paratransit passes and promote ride sharing.
- Parking requirements are reduced if the development is located within 1/3-mile from a BART station.
- Subsidies available for approved TDM programs.

City of Eugene, Oregon

- City's web page: www.eugene-or.gov

Key Policies and Initiatives

- Parking requirements may be reduced (for some land uses) if the developer offers an approved shared parking plan.
- Bicycle parking is required with many land uses.
- Maximum parking ratio is used.
- Maximum parking cannot exceed 125% of minimum parking requirements.
- Parking requirements may be reduced if an approved Transportation Demand Management (TDM) plan is implemented.
- The City offers typical commuter services including bus, car pool, and van pool.

City of Portland, Oregon

- City's web page: www.portlandonline.com
- Commuter Assistance web page: www.portlandoregon.gov/transportation/43820

Key Policies and Initiatives

- Maximum parking for many land uses.
- Parking could be provided up to 500 feet away.
- Stacked parking with valet attendant is allowed.
- Parking requirements could be reduced by 5% for approved carpool programs.
- Parking requirements for residential developments are reduced or eliminated for all other land uses, if:
  - The development is located within 1,500 feet from a transit station, or
  - 500 feet from transit street where peak-hour service is provided at 20-minute intervals.

- Bicycle parking is required for many land uses.
- For every five bicycle parking spaces, one vehicle parking space could be eliminated.
- Parking requirements could be reduced by 10% if a transit supportive plaza is provided with the development.
- Motor cycle parking could be used to reduce vehicle parking by 5%.
- For every two cars sharing parking one vehicle parking space could be eliminated.
    - "Smart Trip Business" initiative to encourage use of alternate modes of transportation. Some of the programs include:
    - Encourage use of bicycle at work place.
    - Businesses could be certified as Sustainability Work Certified. The certifications include Certified, Silver, and Gold.
    - Car sharing programs.
    - Centralized Transportation Resource.
    - Employee education about use of transit.
    - The Commuter Challenge program to encourage the use of alternate modes of transportation.

RECOMMENDATIONS

Recommendation #1: Minimum Parking Requirements that Vary Based on Land Use

1. **Multi-family dwellings and mixed-use dwellings** within the downtown or Transit-Oriented Development (TOD) areas shall provide a minimum number of parking spaces as shown in the following table; the maximum number of parking spaces provided per use shall not exceed 115% of the minimum required except for parking spaces provided in parking structures:

Land Use	**Minimum Parking Requirement (+)**
Rent-by-the-Bedroom	Parking spaces serve multiple users and destinations.
Multi-family Dwellings	Parking spaces/bedroom
All Bedrooms	0.75
Multi-family Senior Dwellings	Parking spaces/bedroom
All Bedrooms	0.3
Multifamily Dwellings (# Bedrooms/Unit)	Parking spaces/unit
One or less	0.75
Two	1
Three	1.25
Four and above	1.5
Demand Mitigation Strategy	**Parking Requirement Reduction (-)**
Affordable Housing (< 50% AMI)	50%[1]
Transit Passes	10%[2]
Car Share	5 spaces/1 car share[3]
Within 1,000 feet walking distance of MAX Station	10%
Shared Parking	Based on Shared Parking Study Results (Land Use Dependent)
Off-Site Parking	1:1
Bicycle & Pedestrian LOS A	10%[4]
Parking Impact Study	Based on Proposal
Transportation Demand Management (TDM)	Based on Proposal
Maximum of 50% reduction without provision of a Parking Impact Study or Transportation Demand Management.	

Recommendation #2: Alternative Compliance Based on TDM or a Parking Impact Study

Built into the Minimum Parking Requirements Matrix is a section that allows for reduction of the requirement based on providing additional parking demand mitigation strategies.

Two other options which are included on the Minimum Parking Requirements Matrix are to provide a Parking Impact Study or utilize the Transportation Demand Management (TDM) program.

Transportation Demand Management (TDM)

The basic concept is to provide a service to helps private employers access a range of parking and trip reduction tools and programs. Connecting developers to resources that can help them reduce parking demands (and therefore potentially lower the amount of parking they would be required to provide) is win-win scenario. The key is having a well-developed program that offers a range of choices that developers or businesses can choose from depending on the type of business or development they are providing.

In most of the programs researched (Washington DC, Arlington County VA, Boulder CO, Ann Arbor MI), defined packages of TDM strategies are available that employers or developers can sign-up for. There is typically a multi-year commitment required and agreements must be signed to qualify for parking reductions as part of an alternative compliance component of a development review process.

A related trend in the world of urban public transport lies in mobility systems that will provide bicycles, cars and other mobility services on demand. In the future, many mobility assets will be shared instead of owned by users. Convenient and reliable lifestyle services will be offered to "connected" citizens who will be able to easily access these combined mobility services via their smartphones. Integrated mobility services are emerging as a smart alternative to vehicle ownership in a rapidly urbanizing world. They offer new and easy to access options that can be tailored to better meet customer needs and address a range of issues related to evolving urban environments.

Combined mobility services take the concept of shared-use to a new level, recognizing that the desires for flexibility and efficiency which are driving consumers to shared-use mobility solutions are further advanced when those solutions can be offered in an integrated platform. For those providers of mobility solutions that make the transition to combined mobility services, these developments offer a real opportunity to deliver sustainable growth over the next decades.

A draft example of a TDM checklist will be provided for review.

Implementation of this recommendation is outside the scope of this project; however, it is recommended that the City of Raleigh budget to create and staff a TDM Program.

Parking Impact Study

Developers may opt to engage a professional parking consultant at their expense to conduct a parking impact study. As the scope of these studies can vary, a matrix outlining a recommended scope to ensure that the essential information needed by City planning staff is provided in Attachment 2.

Costs for such a study vary and can range from as low of $5,000 to a high of $20,000 depending on the exact scope.

Recommendation #3: On-street Paid Parking

Continued investment in paid on-street parking in targeted areas and eventually in other areas of the City (especially in designated TOD development areas) while slowly increasing on-street parking rates until they are higher that off-street parking rates has several benefits. Charging for parking is the most direct way to both reduce parking demand and helps ensure the availability and turnover of on-street and improve the utilization of off-street spaces. This strategy is critical to developing on-going funding mechanisms to support parking infrastructure investment.

On-Street parking has other benefits as well. Beyond adding to the overall supply of parking, on-street parking slows traffic, creates better pedestrian environments by buffering sidewalks from moving vehicles, increases the viability of retail shops and services, and contributes to reducing the amount of land used for off-street lots.

There have been many technological advances related to on-street parking technology and related management applications. It will be important for staff to stay abreast of changes in this fast-evolving area.

Recommendation #4: Public/Private Partnerships for Parking Structures

This recommendation encourages the City to develop a comprehensive approach that emphasizes leveraging parking infrastructure investment as a key element of community and economic development. Parking investments, made as part of an overall TOD business development strategy, should carry an expectation of a 5 to 1 return on public funds invested. To achieve this level of return, projects that offer significant shared parking benefits are strongly encouraged.

To promote the effective management of existing and future public parking resources in the downtown area and in future TOD development areas, a parking district approach which can

coordinate and management parking and access management related issues should be strongly supported. Parking districts offer a mechanism to invest and manage parking resources within a defined geographic area.

Often, the overriding goals of a district are more akin to a business or general improvement district that also manages parking as a tool for overall district management. As the district matures, and development intensifies, the role of the parking district and the types of management programs offered will evolve. In other communities, parking related revenues are often reinvested within the districts to support other strategic district development goals creating 'balanced and sustainable district access strategy.'

Another strategy would be to adopt the Business Scorecard Development Approach for TOD Overlay Zone in conjunction with the development of a parking infrastructure investment strategy that leverages shared parking to the maximum degree.

One approach to developing a downtown or area business strategy is to establish specific targets for housing, office, retail and hotel development within the district. This business strategy would ideally reflect the shared vision for the area and the community at large as defined in a city-wide strategic or master plan. This recommendation may be more appropriate as an element of the City's Urban Redevelopment Authority or similar agency given that these agencies typically oversee tax increment financing and related investment funds.

A model business score card can also incorporate several key parking elements. Key elements can include:

Identification of projects that support defined district master plan goals. Targeting specific development projects that move the forward the shared vision of the district is especially important for helping the district achieve its desired goals. In the case of the City of Raleigh, the downtown and TOD development areas stated goals include such elements as: increased development density (mid-rise developments of four to five stories), compact in-fill development, walkability and good urban design, limited sharable parking assets, etc. There are often many potential development projects to consider, but prioritizing those projects that help move the community forward in the desired direction deserve special consideration and can provide justification for providing reasonable incentives.

As part of the parking support policies being proposed, maximizing the benefits of shared parking is an important consideration. Because of the cost of investing in structured parking, it is in the City's interest to get the most benefit from these public fund investments

SECTION 4: BEST PRACTICE RESEARCH

Innovative municipal parking programs, urban redevelopment agencies, business improvement districts, and downtown development authorities have led the charge as it relates to leveraging investments in strategic parking and mixed-use facility development as a key strategy to improve their communities and stimulate additional economic development opportunities.

A key trend we have identified is that many of these parking programs have developed more advanced and sophisticated planning capabilities in recent years. They have well defined parking analysis zones within their downtowns and actively monitor changes to off-street parking supply and demand. They also have begun to measure and track changes to on-street utilization. Using creative and demand-based pricing and regulation strategies (time-limits, special permitting strategies, etc.) they are beginning to manage their limited on-street resources to maximize their value by more effectively promoting turn-over of the parking spaces. Price is being used, as recommended by UCLA professor, Dr. Donald Shoup, to achieve a goal of an on-street vacancy rate of 15% per block. This has had the related effect of also increasing off-street parking revenues.

These advances in planning and management are being combined with another important trend—a philosophy that aims at making parking, and therefore the overall downtown experience, more visitor friendly. It is important to note that "friendly" does not mean the same as "free." Parking is never free, even when there is no direct charge to the customer—someone somewhere is paying the price for providing not only the parking space, but also the electricity, the maintenance, the cleaning, etc.

As part of the research effort for this project, we focused on identifying new or creative approaches to using parking as a tool for economic development.

Following are a series of case studies including comments from the developing agencies about lessons learned.

One comment received during the document review process was a desire to provide insight on how to leverage parking to incentivize Downtown retail. In response to this comment, we have including Developing a Retail Parking Support Strategy in Appendix A. This document addresses the following:

- Characteristics of Effective Retail Parking
- On-street Parking Strategies
- Off-street Parking Strategies
- Overall Parking Management Strategies

CASE STUDIES

Case Study # 1 — Ashley Mews, Ann Arbor, MI

Ashley Mews was one of the first downtown developments in Ann Arbor since the early 1980s. The City owned a piece of land and wanted to sell it for redevelopment with the goal of seeing some affordable housing units (80% of area median income) included as part of the project.

The Ann Arbor Downtown Development Authority (DDA) helped facilitate the conversation between the City and the developer, Syndeco, the real estate arm of Detroit Edison. Th final arrangement had a 9-story office building with first floor retail and penthouses on the top, and approximately 50 stacked townhouses of which eight are permanently affordable.

The developer brought 120 of their own underground parking spaces, but needed 100 more parking spaces plus gap financing. The DDA provided some funds toward the affordable housing units and additional funds toward the project's pedestrian improvements to make the numbers work.

The City gained a wonderful mixed-use project that made it possible for Detriot Edison to bring 400-500 high-paying jobs (the building houses all the energy company's subsidiaries such as Detriot Edison Nuclear, Detriot Edison Wind, etc.) plus more than 50 new downtown residents (the penthouses were a slower sale because the space wasn't built out and residents clearly had trouble understanding what $1 million was buying them).

Lesson Learned

1. The City must know what it wants upfront in a development deal like this so we can understand if it is worth providing a limited public asset (lots of public parking spaces) to accomplish their goal.

2. If possible, use public/private arrangements to clean up previous mistakes. Before the DDA took over parking, the City had given away parking permits in a contract for three renewable 20-year terms at the cost of operations plus bond payments. The bond payments were ending. If we hadn't revised the agreement the developer would have been paying $10-20/month for permits that cost other downtown users $100/month.

3. Consider all the elements that can make a project work, not just the parking elements.

Supporting Documents (Appendix B)

1. Ashely Mews Development Agreement
2. Ashely Mews Parking Agreement
3. Ashely Mews Planned Unit Development (PUD) Agreement

Courtesy DTE Energy Trading

Case Study # 2 — BoDo Development, Capital City Development Corporation, Boise, ID

The Capital City Development Corporation (CCDC) is the urban renewal agency in Boise, ID. The CCDC manages four separate districts in the downtown area as well as the off-street public parking system.

CCDC has a stated goal of a 5-to-1 return on infrastructure investments. With the recent completion of the BoDo project, they leveraged $15.5 million dollars in public infrastructure investment—Civic Center garage, $8 million; Myrtle Street garage, $6 million; and a $1.5 million investment in streetscapes—in return for $87 million in private development, which yielded a 5.61 return on investment.

Beyond this initial success, this project generated $650,000 in tax increment financing revenues that the CCDC will reinvest in Downtown. The project also is generating an additional 1,000 parkers per day for an estimated $800,000 in additional parking revenue per year. It is also worth noting that the BoDo project brought several targeted types of development to Downtown, including a 17-story residential development, a multiplex cinema, and a new hotel.

Lessons Learned

1. CCDC has successfully used parking development as a catalyst for other development.
2. They have a defined expectation (5-to-1) relative to parking and other infrastructure investments.
3. Their standard agreement is a blank page. Be flexible and consider all options.
4. Residential development projects have more spin-off benefits.
5. The parking strategy was based on an idealized build out of the downtown area based on the Downtown Master Plan. Their Parking Development Plan is designed to support the desired build out.
6. Goals: Keep the public parking supply between 30-40% of the total parking supply and realize that more parking investment is needed on the front end of the process.

Case Study #3 — Village Green, Ann Arbor, MI

Village Green is the Ann Arbor DDA's most recent development project. The City distributed an RFP to sell/redevelop the site of their oldest parking structure. The Village Green project was selected and plans include a multistory apartment building with an underground public parking structure.

The development agreement was much simpler than the Ashley Mews Project. The DDA formulated early what it was willing to provide to make this deal work—$100,000/unit up to four units of affordable housing to 60% AMI = $400,000—and exact dollar amounts for what it would pay to have the underground parking structure constructed—$35,000/above ground space and $45,000/below ground space. This eliminated negotiations later on, as developer bids on the property were made, knowing that these were the only two sources of local funds for the project.

The DDA did not have any developers on its board so knowing the cost up front made sense since they did not have individuals on the board with real estate experience to negotiate for on their behalf.

Lessons Learned

1. If the developer is building a public parking structure as part of a public/private development, come to an agreement up front on what the City is willing to pay per parking space since it is virtually impossible to delineate what is/isn't part of an underground parking structure. Previously, developers wanted to charge the DDA for their construction crane costs, all costs to bring utilities to the site, etc. Once this price is established, it makes it easier to sort between various bids for the site since the variables are reduced.
2. The DDA/Village Green parking agreement provided 73 spaces for monthly parking plus an additional 73 flex parking spaces, leaving a number for public parking. The flex parking numbers made banking institutions more amenable about financing since the project has more parking spaces per unit, even though the flex spaces can only be used at night.

Supporting Documents (Appendix B)

1. Village Green Parking Agreement

SECTION 5: PARKING POLICY PURPOSE

POLICY STATEMENT AND PURPOSE

Historically, the City of Raleigh has constructed, operated and maintained most of the off-street parking supply Downtown. Initially, this mode of operation was to help incentivize redevelopment and new development. Today, the area is thriving with new developments underway as well as many in the planning phase. The City wishes to revisit its policy of being the primary entity providing parking Downtown.

As of January 2017, the City has approximately 700 monthly parking spaces available for rent out of its inventory of 7,600+ spaces. With continued development and demand for parking, there is a clear need for a long-term strategy to accommodate the projected future parking demand. As an example, Red Hat, one of the major employers in Downtown, recently informed McLaurin Parking that they plan to add 200 employees per year for the next three years to their workforce.

The following are the three basic or core strategies that can be pursued, relative to meeting the future parking demand Downtown:

1. Do nothing. Do not provide additional parking supply and let future developments self-park and assume the private sector will build parking to meet their demand. This strategy isn't effective in supporting Downtown development and will yield a fragmented parking system with different parking rates and operational policies as well as an unpleasant experience to the casual Downtown visitor.

2. Build additional parking supply and continue operating in the historical manner. The Raleigh City Council has expressed its desire not to continue this manner of operation for many reasons, one of which is cost. According to an analysis prepared by Kimley-Horn, the probable cost to build a 600-space parking garage Downtown is $20 million, including land and soft costs. The estimated monthly revenue to service the debt associated with this deck, assuming no general fund subsidy, is approximately $165/space/month. This would require an increase in monthly parking rates of 48-50% over the existing rates of $110-$115/month. This strategy also consumes debt that the City could use for other purposes.

3. Add additional parking supply Downtown using public-private partnerships at strategically located developments that are mutually beneficial to the City and the development community. This is the recommended approach for future City parking supply.

Rather than building separate public parking assets, it is recommended the City partner with private development projects in which the private development will provide adequate parking to meet the parking needs of their proposed development. The City will develop an additional amount of public parking within the same development —the exact amount to be determined based on the specific location and availability of other public parking in the immediate vicinity.

By developing parking jointly, the costs of major parking development elements (foundations, stair towers, elevators, mechanical systems, etc.) can be shared, creating significant cost-saving benefits for both parties compared to separate developments, thus providing an additional incentive for the development to occur. Beyond incentivizing quality developments that support the development vision of Downtown, the development of public parking with the new development is designed to provide additional public parking to support anticipated adaptive reuse and in-fill projects that are likely to occur in the immediate area of the new development. The joint development of shared parking assets provides the following benefits:

- Reduces development costs for the City and the developer.
- Encourages the use of shared parking and reduces the overall amount of parking required Downtown.
- Gives the City the ability manage the jointly developed parking facility ensuring consistent, high-quality parking management and promoting the use of parking access and revenue control systems that the community is already familiar with.
- The jointly developed parking facility will be designed in accordance with City parking design guidelines to ensure high quality design standards reflecting industry best practices. (Appendix C)
- Provides a better distributed public parking supply throughout Downtown by providing a supply of public parking in conjunction with the new development to support additional in-fill development and adaptive reuse of other adjacent properties.

To promote the effective management of existing and future public parking resources, the existing consolidated parking management organization currently in use by the City will continue to be strongly recommended. An active parking management program will be a key partner for creating a balanced and sustainable community access strategy (i.e. the parking department will take a more holistic approach to overall downtown access, developing policies and practices that support a more multimodal approach).

Integration of good urban design principles relative to parking facility design also will be prioritized. The goals of this policy element are to better integrate parking infrastructure into the urban fabric and to contribute to a compact and walkable downtown—this includes parking structure design criteria such as street-level activation, a preference for mixed-use parking developments, LEED Silver building certification, etc.

SECTION 6: RECOMMENDED PARKING POLICY OVERVIEW

The recommended parking development policy for the City of Raleigh builds upon its history of recognizing the importance of investment in parking infrastructure. The City should continue to view parking as important civic infrastructure and carefully consider parking as one of several potential incentive options related to attracting new community investment.

The recommended approach encourages several fundamental philosophical and related policy considerations and provides several new parking analysis tools. One of the primary guiding principles of the recommended parking policy is to view parking development projects and the resulting infrastructure as true investments.

As with any other type of investment, there should be an expectation of a specific return for public dollars invested. Based on successful strategies from around the country, a 5-to-1 return is recommended as a goal. For example, if the City were to invest $10 million in a new parking facility, the expected return on this investment would be at least $50 million in private sector investment. This is one means of leveraging parking investment as a tool for community and economic development.

Two of the key lessons learned from communities where this model has been successfully applied include:

1. A reinforcement of the importance of shared parking as a central component of the strategy. This is important because the ability to leverage complementary (as opposed to overlapping) peak parking accumulation factors allows the sharing of spaces between land uses and thereby allows the garage to support more private sector development projects. This greatly enhances the chances of attaining the 5-to-1 return on investment goal.
2. Recognize the importance of retaining ownership and control of parking assets—leasing the spaces, *not giving them away*.

This approach also encourages a broader assessment of the economic impacts of proposed development projects, including: initial project value, jobs creation (short-term and long-term), property tax impacts, estimated sales tax contributions, and potential for stimulating additional development or community investment.

Park+, the new parking demand model developed as part of this study, provides the City with updated parking planning data on an on-going basis as a tool to support the recommended parking policies.

Key Parking Policy Principles

The City of Raleigh parking policy will embrace a comprehensive approach that emphasizes:

- **Leveraging parking infrastructure investment and enhanced parking management as a key element of community and economic development.**
- **Integrating parking planning into the larger Downtown Business Strategy context.**
- **Setting an expectation of 5-to-1 return on parking investments as part of the overall downtown business development strategy.**
- **Ensuring effective management of existing public parking resources.**
- **Supporting a vertically integrated and consolidated parking management organization.**
- **Promoting a balanced and sustainable community access strategy.**
- **Integrating good urban design principles relative to parking facility design to better integrate parking infrastructure into the urban fabric, including criteria such as street-level activation, mixed use parking development, and LEED certification.**

SECTION 7: RECOMMENDED PARKING POLICY

This section lays out eight recommended parking policies. Each policy is presented in the following format:

- A policy statement
- A stated policy purpose
- Key issues related to the policy
- Supporting tools

8 Recommended Parking Policies

Policy #1 Maintain ownership of parking assets and grow the system.

Policy #2 Set an expectation of a 5-to-1 return on parking investments.

Policy #3 Strongly support the concept of shared parking.

Policy #4 Leverage parking investment to support new development opportunities.

Policy #5 Support a consolidated parking management organization to promote effective and customer friendly parking management.

Policy #6 Develop a robust parking planning function.

Policy #7 Create a balanced and sustainable community access strategy.

Policy #8 Promote a "park once/pedestrians first" approach and integrate good urban design principles relative to parking facility design.

Policy #1

Maintain ownership of parking assets and grow the system.

To better leverage parking infrastructure investment as a key element of community and economic development and to develop a more effective downtown development support system, over time the City should maintain public parking assets to be approximately 40% of the total parking supply. To achieve this long-term goal, it is critical that ownership of public parking assets be maintained. The City of Raleigh presently owns approximately 50% of the off-street parking supply downtown. The 40% target has two major goals:

1. Allow the private supply to increase, so the City would have less parking to fund. To achieve this outcome, it will be important to let the parking prices increase to market levels to create more of a financial incentive for the private sector begin see these investments as financially feasible. It is also important for the private sector to realize that the City will no longer continue to build parking as they have in the past, thus the importance of having a well-defined new public parking policy.

2. Maintain a significant share of the overall parking market (40%). It is important in that the City will still have adequate resources to influence market rates and set a high standard of operational excellence as a community benchmark.

Purpose

Many successful downtowns view parking as essential infrastructure and because of this have over-built supply in strategic locations, then worked on multiple tracks to stimulate community development to grow into it. Being ahead of the supply curve is not a bad thing. Who would want to build a water municipal system, for example, with only enough capacity to handle the demand of the current population?

Another approach is to consider the idealized build out of the downtown based on a comprehensive downtown plan, then develop a parking development plan to support the desired build out. This approach should be guided by two major principles. First, keep the public parking supply at approximately 40% of the total parking supply, which provides flexibility relative to attracting new development and creates the capacity to address uses in the realm of the public good. Second, understand that typically more of your parking investment needs to be made on the front end of the process.

The CCDC/BoDo case study cited in Section 3 delves into answering the question *"how much parking is enough for evolving urban areas and transit oriented developments?"* The same case study also illustrates the need to maintain ownership and control of public parking assets. It is important to note that the development of the Myrtle Street parking garage was done with public funds to effectively support the eastern half of the BoDo mixed-use development, specifically the cinema and the new Hampton Inn Suites. However, the CCDC retained ownership of the parking garage. The shared parking nature of the hotel parking needs means that parking will always be available to the hotel without handing over ownership of any spaces or creating long-term exclusive use rights. A memorandum of understanding combined with a practical reality of the parking usage has been satisfactory for all parties.

This approach should be coupled with creating places where people want to be—the combination of integrated parking into the urban form (all your parking should be in convenient, mixed-use facilities with activated street-level uses) and a make a concentrated effort on place making and public realm improvements.

Key Issues

- Manage public parking resources to ensure optimum utilization.
- The ultimate goal of this plan element is to take parking off the backs of the taxpayers.
- Implicit in this goal is the need to maintain ownership and control of public parking assets.

Supporting Tools

- A crafted Community Vision document for Downtown development goals from the recommendation of recent community plans such as retail plans, housing strategies, public space plans, transportation plans, etc.

Policy #2

Set an expectation of a 5-to-1 return on parking investments.

City policy should set an expectation of a 5-to- return on parking investments. These investments will provide community infrastructure to support a variety of private sector developments equaling or exceeding five times the investment value of the parking facility.

Purpose

We often don't look at parking or other infrastructure investments in quite the same way as we do other investments, such as stocks or our 401K. However, there are downtown development agencies and urban renewal districts that have begun setting an expectation of a defined return on infrastructure investments.

This policy was effectively implemented in Boise, ID. CCDC had a stated goal of a 5-to-1 return on parking investments. With the recent completion of the BoDo project, they leveraged $15.5 million dollars in public infrastructure investment—Civic Center garage, $8 million; Myrtle Street garage, $6 million; and a $1.5 million investment in streetscapes—in return for $87 million in private development, which yielded a 5.61 return on investment.

Key Issues

- Better leverage parking and transportation investments.
- Utilize parking investment to catalyze other community and economic development.
- Establish policy goals regarding parking investments.
- Educate developers on the preferred types of development desired by the community.
- Establish an expected return on infrastructure investment.

Supporting Tools

- The City of Raleigh Comprehensive Plan (2030) and the Downtown 2025 Plan provide the vision for Raleigh's future.

Policy #3

Strongly support the concept of shared parking.

To achieve the desired return on investment (Policy 2), the City policy should strongly support the concept of shared parking. The Dillon Parking Deck is a recent example of where the City is an active partner in a shared-use parking facility. Projects that provide the benefits of shared parking should be strongly encouraged and even incentivized as they help the City achieve the desired 5-to-1 parking investment goal. However; it should be noted that deals that allow excessive restrictions on the use of shared spaces reduce the value and effectiveness of this policy and should be avoided.

Purpose

As part of the parking support policies being proposed, maximizing the benefits of shared parking is an important consideration. Because of the cost of investing in structured parking, it is in the City's best interest to get the most benefit from these public fund investments. Where applicable, the effective application of shared parking strategies can extend the reach and impact of investments in public parking and greatly contribute to achieving the recommended 5-to-1 return on infrastructure investments.

Key Issues

- Maximize returns on public parking investment.
- Optimize use of existing parking resources.
- Extend reach of existing parking resources.
- Promote more sustainable parking and transportation strategies.

Supporting Tools

- A Park+ parking demand model.
- A shared parking model.

Policy #4

Leverage parking investment to support new development opportunities.

City parking investments should be used to support new development opportunities, but City parking assets should be leased (with limited restrictions), not given away.

Purpose

While parking is supported as a tool to leverage further investment in Downtown Raleigh, there are right and wrong ways to use it if the ultimate goal is to build an effective parking management program to support the long-term health of the City. When evaluating parking as a potential development incentive, ask the following questions:

- Does this arrangement give away or sell City owned assets?
- Does this arrangement restrict the shared use of City parking assets?
- Prior to offering parking assets as an incentive, has an assessment been developed to quantify the value of the parking assets in both current and future dollars? Have future parking revenues been factored into the assessment? Have costs to replace the parking assets in the future been factored into the assessment?
- If parking is offered as a development incentive, does the value of the development project elements at least equal the value of the parking assets relinquished (if applicable)?
- Are there other economic development incentives that would be equally as effective in moving the deal forward without negatively impacting the development of a strong public parking system?

If the answer to any of these questions is "No", the proposal should be reconsidered or at least be given extra scrutiny.

- If a decision is being considered that violates the principles above, has a City-desired benefit been identified and negotiated to offset the loss of the parking investment?

Supporting Tools

- The document titled *Criteria for Assessing Public/Private Parking Projects* (Appendix D) is a resource for the City to use in evaluating potential public/private projects that may be considered as part of a development project.

Policy #5

Support a consolidated parking management organization to promote effective and customer friendly parking management.

The City should ensure effective management of existing public parking resources. There are several strategies for achieving this multidimensional goal, among them is supporting and strengthening the consolidated parking management organization under the City, stabilizing the public parking supply over time to be approximately 40% of total parking, and establishing a long-term goal of creating a self-supporting parking enterprise.

Purpose

It has been demonstrated that a parking system that is vertically integrated (centrally managed as a single operating agency) and controls, at a minimum, off- and on-street parking, and parking enforcement can become a self-supporting and self-sustaining venture over time. In fact, there are many examples of programs that not only cover their operating and maintenance costs, but also debt service, facility and system maintenance reserves, set aside funds for future parking facility development, provide funding for alternative transportation programs, or provide revenues back into the City's general fund.

In addition to developing a strong, self-sustaining parking program primarily funded by user fees, this investment in parking management can generate additional benefits when directed by an organization that is focused on community development or downtown revitalization. Some of the most advanced, progressive, and successful parking management programs in the country today use this model, including the Cities of Fort Collins and Boulder, CO; Boise, ID; and Ann Arbor and Kalamazoo, MI.

Key Issues

- Have a defined focus on parking management and a comprehensive parking management strategy.
- Create well-defined parking management policies and procedures.
- Create a parking planning program element with defined parking planning and management criteria, metrics and benchmarks.

Supporting Tools

- A Park+ parking demand model.
- A set of adopted parking management internal benchmarks. (Appendix E)

Develop a robust parking planning function.

In general, municipal planning programs are primarily focused on land-use planning and often do not have a great deal of experience or specialized expertise in the specialized realm that is parking planning. City Parking departments have a special interest in parking planning but often are not trained planning professionals. This common set of circumstances is an issue for many communities and one in which a more collaborative relationship between parking and planning professionals can greatly benefit both groups.

Another important element in this area the development of parking planning tools. The Park+ parking demand modeling tool that is provided to the City as part of this project will be a great benefit to both the parking and planning groups going forward.

Within the City Parking Program, a special focus on the development of a more robust parking planning function is recommended. Using the Park+ tool, the City should plan future public parking investments on a quadrant or district basis. Park+ provides the capability to keep parking supply, utilization, and land-use data up to date. Keeping this data current is a key policy objective as this will greatly enhance the City's ability to effectively assess the parking dimensions of new development proposals as well as to plan for future parking needs.

Purpose

- Use Park+ to create customized parking assessments for proposed development projects by selecting an area around the proposed development site (typically defined by walking distance tolerance).
- Define the parking adequacy specific to the City of Raleigh using the Park+ tool. Develop specific parking criteria for each of the four downtown quadrants or special parking districts. Monitor these base planning numbers on a regular basis.
- As the parking supply and community access patterns change over time, adapt parking and transportation strategies to improve access, enhance the customer experience, and increase event success and attendance through better communications, coordination with Police and Public Works, and by being responsive to feedback from businesses and stakeholders.
- Consider not only the localized demands created by a specific development, but also how that development's parking needs align with the needs of the specific quadrant or district it is located in. Consider a variety of parking needs, including a range of employee parking options; short, intermediate and long-term parking options; retail support parking; special events parking; etc.

Key Issues

- Understand parking needs/issues and ongoing monitoring.
- Document and assess the localized parking demand issues (parking hot-spots).
- Stay ahead of the curve relative to parking needs.
- Use the Park+ model to provide more effective parking analysis related to new development projects.

Supporting Tools

- The Park+ demand model.

Policy #7

Create a balanced and sustainable community access strategy.

An important philosophical shift that is recommended is to stop thinking about parking as a separate function and begin to shift to an access or mobility management perspective in which parking is an important component of the larger community transportation equation. This perspective, places more focus on providing a broader range of access management strategies, including a greater emphasis on transportation demand management, transportation alternatives, shared mobility strategies, shared parking, and transit supportive parking policies, including parking rate adjustments.

The following program goals and issues geared toward developing a more balanced parking and transportation program are highlighted for future program development.

- The parking program will be a partner for success in achieving a balanced and sustainable community access strategy. Coordination and collaboration with local transit agencies, the Downtown Raleigh Alliance, North Carolina State Government, and other large employers is essential.
- Demand-side strategies should be given equal importance to supply-side strategies.
- Work collaboratively with agencies to create a tool to monitor progress in decreasing single occupant vehicle usage (i.e., develop a Mode Split Monitoring Report).

Purpose

Eliminate the habit of putting parking into its own silo. The focus should be on developing an integrated access management strategy for downtown that supports other community goals such as walkability, congestion management, public safety, alternative transportation modes, environmental responsibility, and the creation of places for people.

Key Issues

- Define key elements of a comprehensive and integrated transportation/access management strategy.
- Define key metrics and access management strategy goals.
- Develop measurement strategies and tools.
- Conduct measurements and establish the current baseline in primary access categories such as parking, transit, light rail, bikes, walking, carpools/vanpools, etc.
- Parking specific criteria might include parking supply/demand, public vs. private supply, Raleigh-specific public parking demand ratios, on-street utilization (e.g., achieve 15% availability), parking supply within walking distance to key demand generators, etc.

Supporting Tools

- Parking demand model. (See sample report outputs.)
- Transit and Metro Rail Monthly Ridership Reports.
  - Local boardings per weekday
  - Local boardings per mile
  - Express boardings per weekday
  - Average express boardings per trip

Policy #8

Promote a "park once/pedestrians first" approach and integrate good urban design principles relative to parking facility design.

The City should actively promote the integration of good urban design principles relative to parking facility design to better integrate parking infrastructure into the urban fabric, including criteria such as requiring street-level activation, preferences for mixed-use parking development, or LEED or Green Garage certification for all future mixed-use parking facilities.

Purpose

Urban design is often mistakenly treated only as a beautification filter that is tacked on at the end of the development approval process. From the beginning of a development proposal, urban design needs to be understood as the product output to ensure value is simultaneously understood and weighed with cost.

Public sector development of its parking can produce physical and financial benefits. The same can be true for private sector parking development. Purely utilitarian-looking and operating parking facilities can be an economic liability, no matter what was spent on it. Conversely, a parking property that is designed to a high standard to look good and work well is an economic development benefit

IN addition, promoting walkability and offering multiple options to move around the downtown without driving and parking multiple times promotes less traffic, congestion, pollution, and better supports local businesses.

Key Issues

- Community education of transportation options.
- Special event parking information.
- Evaluate creative alternative transportation options.

Supporting Tools

- Periodic pedestrian surveys.
- Parking facility design guidelines.

SECTION 8: POLICY APPLICATION EXAMPLE

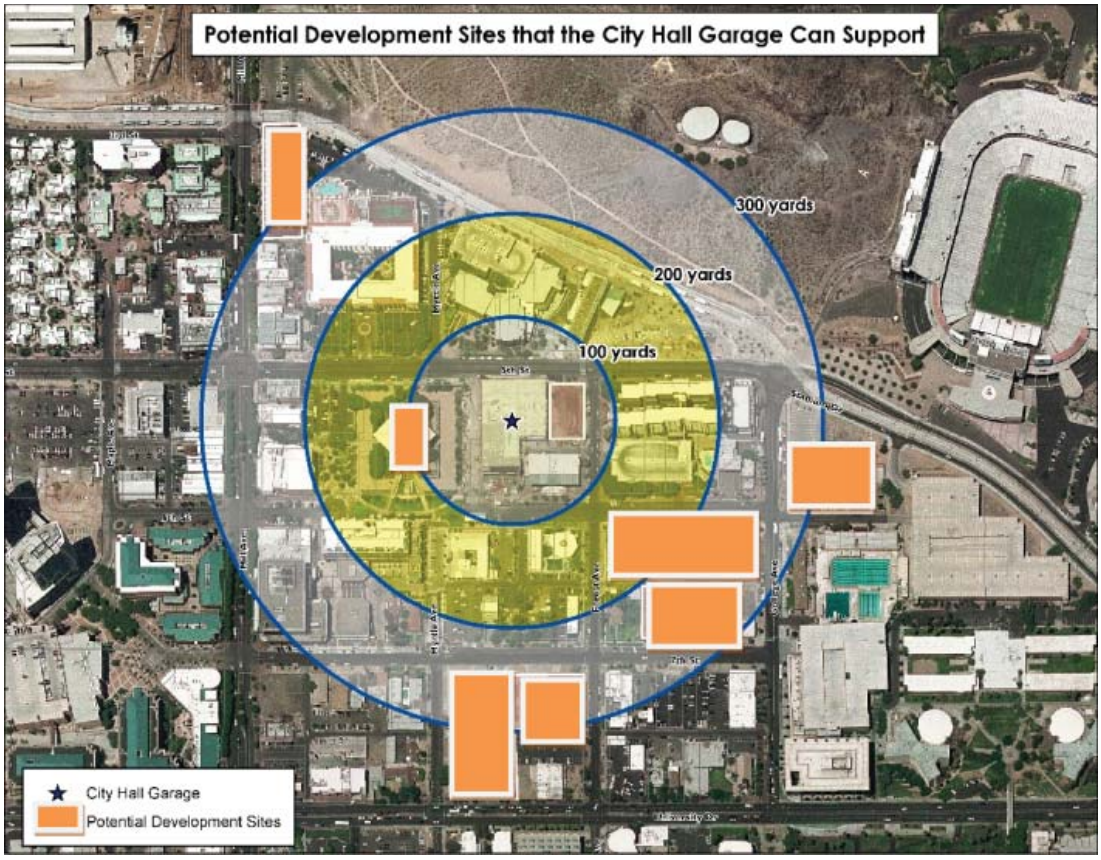
Consider the recent investment in the City Hall garage in Tempe, AZ as an example of how the recommended policy might be applied.

The City Hall garage represented a $22 million investment. Using the 5-to-1 return of investment guideline, a return of $110 million in private sector investment would be targeted.

Up to seven potential development sites were located within a reasonable proximity to the new garage as shown in the image below. The number of projects the garage could support depended on several variables such as project size, proximity to the parking facility, types of users, and land use combination.

This combination of land uses is significant because it defines the potential for shared parking. Certain land uses, because they offer complementary parking (i.e., not overlapping), peak parking demand periods can provide for greater shared parking benefits.

One of the best examples of complementary land uses is hotels. The typical peak parking accumulation for hotels occurs overnight as opposed to an office use, which has its parking accumulation peak between 10:00 AM and 3:00 PM.

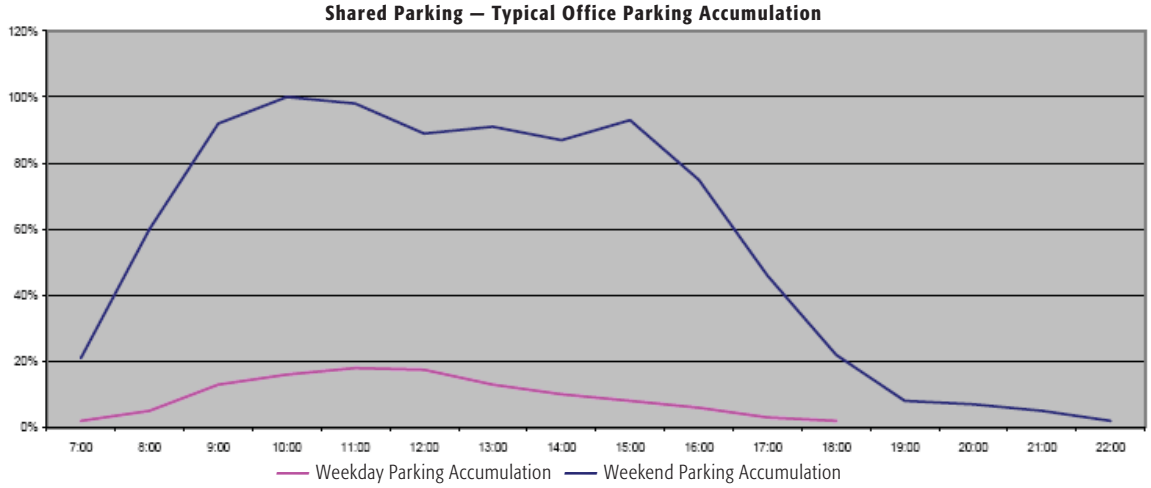


Consider the following theoretical development scenario:

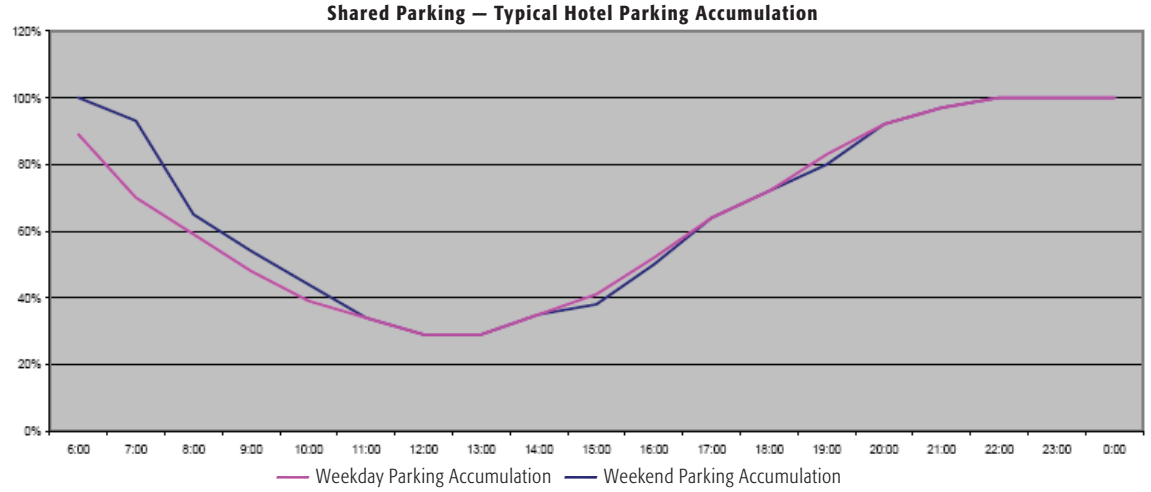
Development Description — A moderate sized mixed-use development containing office, retail, and hotel uses.			
Land Use	**Units**	**Parking Demand Ratio**	**Stand-alone Parking Requirement**
Office	90,000 Sq. Ft.	4 spaces/1,000 SF	360 spaces
Retail	10,000 Sq. Ft.	4 spaces/1,000 SF	40 spaces
Hotel	200 Rooms	1.25 spaces/room	250 space
		Total	**650 spaces**

The following graphs illustrate the typical parking accumulation patterns for an office and hotel. The patterns are virtually inverse of each other. That is to say they have "complementary" as opposed to "overlapping" peak parking accumulation patterns.

Shared Parking — Typical Office Parking Accumulation



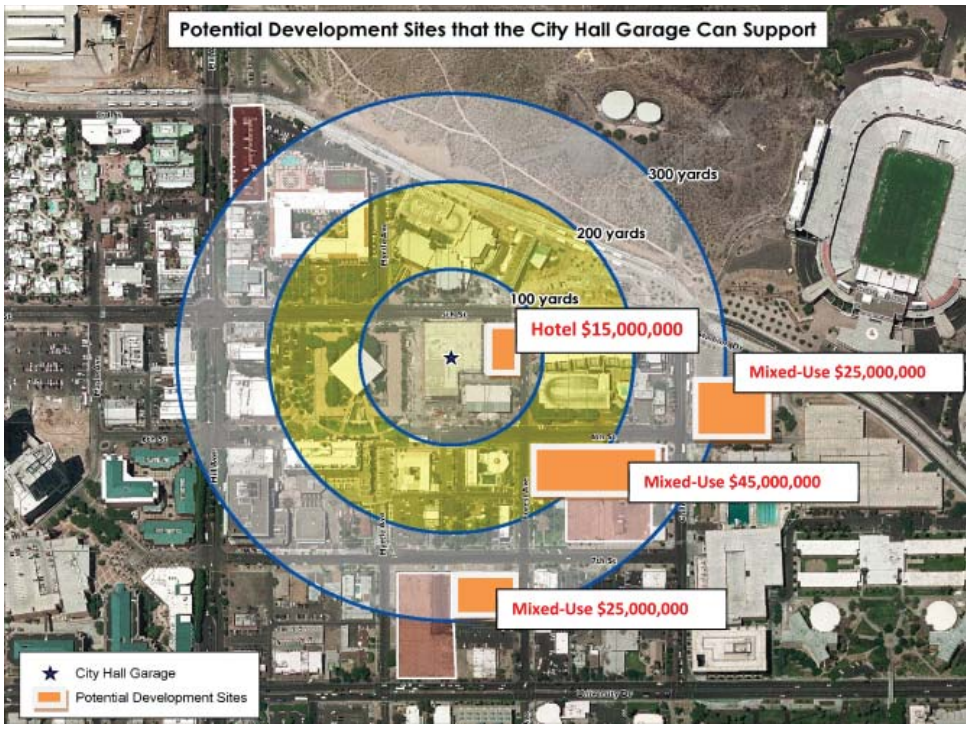
Shared Parking — Typical Hotel Parking Accumulation



Through the application of shared parking, the entire 250-space hotel parking requirement could be accommodated in the parking provided for the other uses. Assuming that the hotel will have management, operations, and some restaurant staff on duty during the day, it would be reasonable to assume that, for this development, a parking demand reduction of 200 spaces from the original 650 spaces could be applied. A construction cost of $30,000 per space equals an investment value of $6 million. Because the hotel can be accommodated in off-peak demand periods that means that the 200 spaces can accommodate another development to help achieve the investment target, assuming that the control of the spaces has not been taken out of the equation by assigning ownership or legal control to another entity. If this is done, the City must view this as a loss not only of the investment in the spaces ($6 million) but also the potential loss of another $25-35 million development project that could have been supported by the 200 spaces.

The image to the right shows four potential development projects that could be supported by the investment made in the City Hall garage.

This is not saying that the City Hall garage can fully support these developments on its own, but allowing access to a certain number of leased spaces at market rates, combined with the shared parking benefits from one or more hotels, the City could get close to achieving to desired return on investment, which translates into significant community and economic development. The key point is that assigning exclusive use agreements or other practices that significantly restrict parking space usage could mean a significant reduction in new community investment.



The recommended parking development policy for the City of Raleigh builds upon its history of recognizing the importance of investment in parking infrastructure. The City should continue to view parking as important civic infrastructure and to consider parking as a key element in proposed development deals.

The table below shows the City of Sacramento, CA's results in implementing a defined business recruitment and development strategy. Each of the developments had a synergistic effect on other downtown developments. Four key projects were funded and facilitated by the City's Economic Development's Downtown Development arm along with key strategic partners. Collectively, the projects add 440 jobs and $2.9 million to the tax base.

Project	Total Investment	Estimated New Annual Revenue	Significance
Sheraton Hotel/ Parking Garage Sale	$130 million	$600,000	Sale produced a $50 million windfall of additional resources for the City and redevelopment agency. A portion of them money was used for further reinvestment on K Street.
The Cosmopolitan Cabaret and Restaurant	$15.4 million	$550,000	Activated a major corner at 10th and K Streets, complementing other attractions nearby, including the Crest Theater, Ella Restaurant, IMAX, and the newly opened Citizen Hotel.
Citizen Hotel	$70.2 million	$1.6 million	As one of the first high-rise buildings in Sacramento's history, the renovated Cal West Building was transformed into the Citizen Hotel, the first-ever boutique hotel in the Central Business District.
Orleans Hotel Condominiums	$13.9 million	$150,000	The newly constructed condo project is a recreation of the 1800s-era building. This will activate 2nd Street in Old Sacramento and bring in residents Sacramento's historic district. Within the first three months of opening, more than 30% of the 24 condos were leased and a restaurant was opened in late 2009.

This example can be related to the City of Raleigh in two ways. First, it illustrates a community that had a specific business recruitment strategy; and secondly, the numbers associated with these real-life projects in Sacramento reinforce the conservative nature of the estimates used in the City Hall Garage example above as well as the achievability of the recommended 5-to-1 return on parking investment policy.

SECTION 9: ADDITIONAL RECOMMENDATIONS TO MAXIMIZE THE BENEFITS OF THE RECOMMENDED PARKING POLICIES

Parking programs are most successful when the overall philosophies, policies and programs are aligned with a larger set of community strategic goals. The creation of a defined shared vision for the downtown—whether through the creation of a new downtown master plan or the assembly of elements from multiple existing plans—can be an important element for ensuring that parking and transportation support systems are developed in a manner to most effectively help the community achieve its overall goals.

In November 2016, the residents of Wake County approved the Wake County Transit Plan. This plan will be implemented by placing a half-cent sales tax to fund a 10-year $2.3 billion-dollar investment in transit. Many downtowns with successful transit systems have monthly and transient parking rates significantly higher than Raleigh. For example, the rate for off-street transient parking in Charlotte ranges from $4-10/hour, depending upon location. An increase in Downtown Raleigh's parking rates to incentivize greater use of transit could be an example of the alignment of goals. However, higher parking fees may also serve as a deterrent to development and may cause developers evaluating Downtown locations to consider building in suburban areas.

Another important and emerging area of focus is the need to support shared mobility strategies as an effective and complementary support systems to traditional transit programs. See Appendix F: Shared Use Mobility Overview for more detail.

Based on the defined and shared vision for Downtown, it is important to develop a specific Downtown Business Strategy to establish specific targets for housing, office, retail, and hotel development within Downtown. This business strategy should be built upon the shared vision for Downtown and incorporates recommendations from a variety of sources such as housing strategies, retail studies, transportation plans, City comprehensive plans, and zoning plans.

In conjunction with this strategy, the creation of a Business Strategy Scorecard as a tool is helpful for reinforcing the primary strategy goals and documenting progress and accomplishments. A template for a scorecard is provided in Appendix G of this document.

With the knowledge of specific business recruitment strategies, the parking program could play useful role in collaborating with City economic development staff related to quantifying the potential parking impacts of these targeted developments, especially with the addition of new Park+ parking demand model.

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ADDITIONAL RESOURCES

The following documents will be provided to City staff on a CD as additional resources.

1. U.S. Parking Policies: An Overview of Management Strategies
2. Residential On-Site Carsharing and Off-Street Parking Policy in the San Francisco Bay Area
3. Alternatives to Minimum Parking Requirements – Forinash
4. City Carshare - Best-Practices
5. Effects of TOD on Housing, Parking and Travel
6. Parking Solutions - Examples and Case Studies
7. Exposed: America's Totally Inconsistent Minimum Parking Requirements
8. FHWA - Parking Pricing Primer
9. Integrating Demand Management into the Transportation Planning Process: A Desk Reference
10. How Flexible Parking Requirements Spur Economic Development: Lessons from Santa Monica
11. Parking Reforms for a Livable City - Centre for Science and Environment - New Delhi, India
12. Parking Guidelines for Downtown Kirkland, WA
13. Parking Management Strategies for Downtown Kirkland, WA
14. Montgomery County MD Parking Policy Study – Summary
15. Montgomery County Parking Policy Study – Spring 2011 – ZAP Summary
16. The Myth of Free Parking - Transit for Livable Communities
17. New Suburbanism: Reinventing Inner-Ring Suburbs
18. NYC Parking Best Practices
19. Parking Requirement Impacts on Housing Affordability – Litman – VTPI
20. Parking Management Tools - A Discussion of Time-Limits and Pay Parking
21. Westport Parking Study & Commercial Design Guidelines – City Council Presentation
22. Parking Best Practices – A Review of Zoning Policies and Regulations in Select US and International Cities
23. Parking Code Guidance: Case Studies and Model Provisions - MTC Smart Growth Technical Assistance: Parking Reform Campaign
24. Parking Management - Strategies, Evaluation and Planning – Litman – VTPI
25. Article: Yes, Parking Reform is Possible – Shoup
26. Policies for Shareable Cities: Transportation
27. Quantity versus Quality in Off-Street Parking Requirements - Vinit Mukhija and Donald Shoup
28. Parking Study for Dania Beach Parking - Implementation Plan – Kimley-Horn
29. Driving Urban Environments: Smart Growth Parking Best Practices - Governor's Office of Smart Growth, Annapolis, MD
30. Smart Growth Network Multimodal Incentives
31. Strategies and Tools to Implement Transportation-Efficient Development: A Reference Manual Phase 2 of Integrating Land Use and Transportation Investment Decision-Making
32. TOD and Transit Station Area Principles – Kimley-Horn
33. Tools for Mixed-Income TOD - Douglas Shoemaker/Center for Transit Oriented Development
34. The Transportation Prescription - Bold New Ideas for Healthy, Equitable Transportation Reform In America
35. Arlington County Residential Transportation Performance Monitoring Study - Sept-2013

APPENDICES

APPENDIX A: DEVELOPING A RETAIL PARKING SUPPORT STRATEGY

The provision of short-term, retail supportive parking is a key issue to encourage and strengthen the resurgence of downtown Raleigh. Specific strategies and approaches are outlined below.

Characteristics of Effective Retail Parking

Revitalizing retail in a downtown setting is one of the most difficult elements of downtown revitalization to get right. Convenient, plentiful and easily accessible parking is especially critical to the success of retail in a downtown area.

What is often overlooked or underestimated in retail revitalization projects is a comprehensive "retail parking strategy". In many cases this will involve significant investment in new parking infrastructure or at least a restructuring or reallocation of existing parking resources. Once the parking supply issues have been addressed, a wide range of parking management strategies should also be considered.

Taking a comprehensive approach to downtown retail parking is important because of the significant differences in the downtown environment compared to "the competition" i.e., suburban malls or the big box store approach. The suburban malls and big box stores have several obvious advantages over downtowns.

- Plentiful land on which to provide cheap (perceived as free) surface parking
- Simple, easily understood access characterized by direct line of sight from the parking lot to the store(s)
- Generally high levels of service as expressed through short walking distances, more generous parking stall widths, etc.
- Single ownership/control and dedicated parking resources
- More ability to control employee parking behaviors through direct management

Downtowns have, in recent years, seen unparalleled success in their revitalization efforts. It is interesting to note that this success has not gone unnoticed by the shopping center industry. They have adapted their strategies to stay competitive. There is only one enclosed (now considered "old style") mall under construction in the US this year. The new trend for shopping centers is "Life Style Centers". These new shopping destinations emulate the character and features of "genuine downtowns" or "main streets". They often have all the amenities of downtowns and few of the "warts". The worst that can be said of them is that they lack that ineffable quality that comes with time, history and the diversity of a real downtown. They may feel inauthentic and "cookie cutterish". However, they usually have plentiful, well located and (very often) free parking.

While we can rarely start with a "clean slate" in downtown environments when it comes to parking, there are some basic principles relative to effective retail parking strategies that can be employed to give retail a fighting chance in the downtown. The key elements of a downtown retail parking strategy are outlined below:

I. **On-street Parking** – As the most conveniently located parking assets (and therefore the most valuable), effective management of on-street parking is critical. This generally includes:

- On-street parking being prioritized for short-term, visitor parking.
- On-street parking being priced higher than off-street parking.
- Having an effective and consistent parking enforcement function – the primary goal of which is to enforce the rules designed to promote on-street space turnover.
- Having an effective combination of time-limits to support the specific uses on downtown retailers. For example, coffee shops and dry cleaners have different needs than restaurants and clothing stores.

- The use of easy to read/color-coded time-limit stickers on meters is a simple but important tool that lets drivers know the time-limit of an on-street space before pulling in to park.
- Having an effective downtown loading zone plan to support retail deliveries.
- Implementing a fine structure for on-street parking that is more forgiving to the occasional violator and more aggressive toward the real problem – repeat long-term parkers taking up what should be short-term parking.
- Defining a well-developed legislative framework that supports enforcement practices (such as having a local ordinance that requires vehicles to move more than 1 block face after moving from one time-limited space to another.)
- The use of new parking enforcement technologies to improve the efficiency and effectiveness of enforcement efforts, such as computerized parking enforcement hardware and software programs and mobile license plate recognition systems with GPS capability.
- Consistent but unpredictable parking enforcement routes.
- A combination of on-street parking rates, fines and enforcement that ultimately promotes a consistent 15% vacancy rate for on-street spaces. Having a 15% on-street vacancy rate is considered important because it makes the downtown area appear to be more accessible and encourages potential customers to stop and shop if they see a well-designed storefront that appeals to them.
- In combination with the strategy above, providing signage about the availability of off-street retail parking is also important so that customers feel they have choices.
- The use of new on-street parking meter technologies that provide more customer-friendly payment options (this can either be multi-space meter or new single space meters that accept credit or debit cards) is becoming a primary strategy for downtowns. This has been aided by technological advances that incorporate wireless communications and solar power to reduce system installation costs.

II. **Off-street Parking** – In a downtown environment the primary issues related to retail parking are to provide large, easy-to-find reservoirs of parking within close proximity to the retail cores or corridors. Small pockets of off-street parking may be useful for those who frequent the downtown area, but these resources are not adequate to effectively support a successful retail "hot spot". Specific issues for retail parking include:
    - As much as practical, retail parking reservoirs should be located within line-of-sight of the retail anchors and very convenient to the contiguous retail corridors.
    - The street level of retail parking structures should be designed to maintain the street-level activation of the area by incorporation retail into the at-grade level. To support this primary design criterion, higher first floor heights should be planned.
    - To the greatest degree practical, designing for a higher parking facility level of service of "user comfort factor" is recommended. Creation of a defined set of parking garage design criteria with higher levels of service for short-term retail is recommended. These design criteria include such items as more generous parking bay and stall width dimensions, end-bay turn radii, floor-to-floor heights, enhanced lighting, etc.
    - For a parking facility that is specifically designed to support a retail patronage, "user comfort factors" of A or B are recommended (high ease of use standards).

- Direct connections from the retail parking structure to a retail anchor (via sky bridge, for example) are desirable features.
- The perception of safety and security is critically important for a retail parking facility. Recommended design strategies for improving parking facility security include: glass-backed stair and elevator towers, adopting enhanced lighting levels (in excess of IES minimum requirements), painting interiors white to improve lighting reflectivity and enhancing the feeling of openness, securing the areas beneath stairwells, etc.
- Effective wayfinding and facility signage is essential. Parking signage should be a significant element of a comprehensive wayfinding program. As we do a better job of architecturally incorporating parking into mixed-use facilities, sometimes we "hide the parking" too well. Because of this, enhanced parking facility entrance signage is also very important.
- Other interior facility enhancements such as creative level-theming concepts, interior wayfinding and level identification signage can also help make garages more colorful, visually interesting and aid patrons by making it easier to remember where they parked. This approach can also be used to connect with other community groups – for example some communities engage local artists by using garage level theming projects as art competitions. Similar projects include turning bike racks and bus stops into opportunities for community art.

III. **Overall Parking Management** - From a management and operations perspective, there are many effective strategies that downtown parking programs can employ to better support the larger community's strategic goals. Parking programs too often become focused on parking facility revenues or enforcement quotas to justify their programs. The best programs are those with a broader perspective and that align their policies to help the communities they serve achieve success. Often, by doing this, they achieve an even higher level of success themselves – both in terms of stimulating additional traffic (and therefore parking revenue) and also by becoming a valued and integral partner in the success of the downtown. The following is a short-list of strategies to frame the possibilities:

- Programs such as a "First Hour Free" for off-street public parking facilities can make downtown appear more visitor friendly while providing both a more equitable program and simplifying the administration of traditional parking validation programs. While we support programs such as "First Hour Free" as an element of a larger downtown revitalization initiative, we recognize that paid parking in a downtown environment is a basic economic reality. We support the philosophy that "Parking should be friendly – not free". In one community where the "First Hour Free" program was enacted, parking rates were reassessed after four years. The downtown stakeholders were given a choice of no rate increase, but elimination of the "First Hour Free" program and they unequivocally wanted to keep the "First Hour Free". This intrigued us enough to do some more research. It turned out that in the four years the "First Hour Free" had been in effect, downtown sale tax revenues had doubled and the average parking transient length of stay had grown from 2.11 hours to 3.56 hours. Not all of this is direct attributable to the "First Hour Free" program, but the downtown merchants credited the program as one of the key elements to the revitalization of the downtown.

- Another positive trend in the industry is the reinvestment of a portion of on-street and enforcement parking revenues back into the districts from which they were generated. This reinvestment can take the form of financial contributions to downtown organizations to promote the marketing of the district, investment in specific district projects such as wayfinding projects, area wide Wi-Fi, flower basket programs, pop jet fountains, banner programs, etc. This reinvestment makes the districts more attractive and customer friendly and therefore more successful. It also makes the local merchants more tolerant of needed paid parking and enforcement programs, because they see the benefits of not only the increased on-street space turnover, but also tangible downtown improvements that their customers appreciate.
- In off-street retail parking facilities the lower levels (or more accurately, the most convenient parking areas) should be reserved for retail customer use. Employees or other groups should be assigned to park in other areas of the facility. Depending on the facility design, enforcement of these allocation strategies can often be enhanced through the use of what is termed “nested parking areas” using access control gates and card readers.
- Improving the training and customer service of frontline parking employees can have a huge effect because of all the individual “touches” parking staff make with the public on a daily basis. Training parking staff (cashiers, maintenance and enforcement staff) to adopt the role of “downtown ambassadors” rather than just parking attendants is a key attitude shift that should be actively promoted.
- Painting the interior of parking facilities and adding color (either through level theming graphics or even advertisements) can enhance parking facility interior environments and make facilities feel brighter and safer. Generally speaking, parking facilities have been treated as very utilitarian structures – at best they were dull, grey and functional. At worst, they were dark, scary and dangerous. Investment in parking facility interior facility enhancements is part of making downtowns a more interesting and attractive destination.
- The use of newer technologies and more customer friendly parking access and revenue control systems can reduce wait times upon exiting and improve customer service by providing more convenient customer payment options.
- These days there is a both a “real world” and a “virtual program identity” on-line. Enhancing parking websites with effective tools such as interactive parking maps, on-line payment options, parking rate, special events and other information is expected these days. An important “best practice” in this area is a website that provides a comprehensive overview of downtown including retail and restaurant offering, cultural and special event venues and of course parking and transportation info. The best websites have an overall map of the downtown with the ability to turn on each of the elements above as a “map overlay”.
- Leveraging all of these program enhancements into a recognizable parking “Program Brand” can make people associate all the program enhancements with the public parking facilities and therefore they are more comfortable with downtown parking. Some communities even have radio ads promoting their parking system. In some communities the public parking programs have made such noticeable strides forward that all the private parking operations were forced to also raise the standards of their operations. We call this the “high tide raises all boats” phenomenon.

APPENDIX B: SAMPLE DEVELOPMENT AGREEMENTS

- Ashley Mews Development Agreement
- Ashley Mews Parking Agreement
- Ashley Mews Planned Unit Development (PUD) Agreement
- Village Green Parking Agreement

ASHLEY MEWS DEVELOPMENT AGREEMENT

DEVELOPMENT AGREEMENT

THIS DEVELOPMENT AGREEMENT ("Agreement") made and entered into this _____ day of April, 2000 is by and between **SYNDECO REALTY CORPORATION**, a Michigan corporation, whose address is 660 Plaza Drive, Suite 2300, Detroit, Michigan 48226 ("Developer"), and **ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY**, a public corporation organized and existing pursuant to Act 197, Public Acts of Michigan, 1975 whose address is 100 North Fifth Avenue, P.O. Box 8647, Ann Arbor, Michigan 48107 ("DDA").

PRELIMINARY STATEMENT

Developer proposes to construct a mixed-use development of residential, retail and office uses on the property described in Exhibit "A", attached hereto and made a part hereof by reference thereto ("Property"). Developer has applied to the City of Ann Arbor ("City") for approval of the Ashley Mews Planned Unit Development ("PUD") to accommodate the construction of such mixed uses within one (1) unified and cohesive development in a manner and with a physical configuration that optimizes the use of the Property. The Property is located within the Downtown Area and the City Planning Commission has determined during a public hearing on the PUD that it is desirable to develop the Property in the manner described above. On October 18, 1999, the City approved the PUD subject to the contingency stated in the resolution of approval.

As part of an Option Agreement with the City ("Option Agreement"), attached hereto as Exhibit "B" and made a part hereof by reference thereto, Developer proposes to acquire part of the Property from the City and, in turn, sell to the City (or its designee) eight (8) residential units ("Units") to be resold by the City (or its designee) for "affordable housing" upon such terms and conditions as the City (or its designee), in its sole and absolute discretion, shall determine.

Developer will sell the Units to the City (or its designee) at a price that is substantially less than the projected market price for the Units.

As part of the PUD, Developer shall construct significant public access pedestrian improvements, including, but not limited to, the mews (pedestrian walkway between South Main and South Ashley streets), brick walkways, an outdoor seating area, and extensive landscaping in the approximate quantities described in Exhibit "C", attached hereto and made a part hereof by reference thereto ("Pedestrian Improvements").

Finally, as part of the PUD, Developer shall provide not less than one hundred twenty (120) spaces of underground parking without public subsidy.

NOW, THEREFORE, in consideration of the mutual promises contained herein, and other good and valuable consideration, receipt whereof is hereby severally acknowledged, Developer and DDA hereby agree as follows:

1. DDA Commitments. Subject to satisfaction of each of the conditions specified in Section 1(c), the DDA commits to the following:

Binder copy (also filed under Syndeco)

(a) The DDA shall pay to the Developer the sum of Five Hundred Eighty-Nine Thousand Eight Hundred ($589,800) Dollars to fund part of the cost of the construction of the Pedestrian Improvements, payable in three (3) installments as follows:

(i) One Hundred Thousand ($100,000) Dollars on or before the later of (A) June 30, 2000; (B) ten (10) days after the date that Luckenbach Ziegelman Architects PLLC (the "Architect") delivers a written certification to the DDA confirming that the construction of the PUD is more than one-sixth (1/6) completed.

(ii) Three Hundred Thousand ($300,000) Dollars on or before the later of (A) December 31, 2000 or (B) ten (10) days after the date that the Architect delivers a written certification to the DDA confirming that the construction of the PUD is more than two-thirds (2/3) completed.

(iii) One Hundred Eighty-Nine Thousand Eight Hundred ($189,800) Dollars on or before the later of (A) September 30, 2001 or (B) ten (10) days following the date that the Architect delivers a written certification to the DDA confirming that the PUD is substantially completed in accordance with the PUD.

(b) DDA shall pay to Developer the sum of Seventy-Five Thousand ($75,000) Dollars from the DDA's Housing Fund to defray in part the Developer's lost revenue with respect to the sale of the Units to the City (or its designee) for affordable housing. This sum shall be paid in two (2) installments as follows:

(i) Thirty-Seven Thousand Five Hundred ($37,500) Dollars upon the closing of the sale of the first (1st) Unit by Developer to the City (or its designee); and

(ii) Thirty-seven Thousand Five Hundred ($37,500) Dollars upon the closing of the sale of the eighth (8th) Unit by Developer to the City (or its designee).

(c) The commitments of the DDA in this Section 2 are subject to satisfaction (or a waiver in writing by the DDA), of each of the following conditions on or before each of the following dates:

(i) Prior to or concurrent with the signing of this Agreement, the Developer and the City shall have signed and become bound by the PUD Development Agreement attached hereto as Exhibit "D" and made a part hereof by reference thereto;

(ii) Prior to or concurrent with the signing of this Agreement, the DDA and the Developer shall have signed and become bound by the Parking Permit Agreement in the form of Exhibit "E", attached hereto and made a part hereof by reference thereto;

(iii) Prior to or concurrent with the signing of this Agreement, the Developer shall sign and become bound by and the City shall have accepted the

Easement Agreement in the from of Exhibit "F", attached hereto and made part hereof by reference thereto;

(iv) Prior to or concurrent with the signing of this Agreement, the DDA and Detroit Edison Company shall have signed and become bound by, and the City shall have acknowledged and accepted, the Addendum to Parking Structure Agreement in the form of Exhibit "G", attached hereto and made part hereof by reference thereto; and

(v) Prior to the signing of this Agreement, the Developer shall have commenced construction of the PUD.

Unless each of these conditions is satisfied (or waived in writing by the appropriate party), on or before the date specified above for such condition, then this Agreement, and all of commitments of the DDA and the Developer in this Agreement, shall be null, void and of no further force or effect.

2. Developer shall make no assignment under this Agreement without the prior written consent of DDA, which consent shall not be unreasonably withheld, delayed or conditioned: provided, however that Developer may assign this Agreement to Ashley Mews, LLC and/or Syndeco Plaza, L.L.C., each of which is a Michigan limited liability company, controlled by Developer. In the event of any such permitted assignment, (a) Developer shall notify the DDA of the assignment in advance and in writing, (b) Developer, Ashley Mews, LLC and/or Syndeco Plaza, L.L.C. shall each individually be fully liable for the performance of the obligations of Developer under this Agreement and (c) the document of assignment shall specifically confirm the joint liability described in Subsection 2 (b) .

3. The Developer acknowledges that the DDA is making the financial commitments in Sections 1(a) and 1(b) in reliance upon the commitments of the Developer in Paragraph P-2, P-4 or P-7 of the PUD Development Agreement, Paragraphs 12 and 15 of the Option Agreement or any Paragraph of the Easement Agreement (the "Commitment Paragraphs"). The Developer will notify the DDA in writing in advance of any proposed agreement with the City to cancel or to amend any Commitment Paragraph. Moreover, if that cancellation or amendment materially alters the obligations of the Developer under the affected Commitment Paragraph, then, unless such cancellation or amendment is approved by the DDA in its discretion, the DDA will be released from any future payment obligations under Sections 1(a) and 1(b).

4. The Developer shall indemnify and hold the DDA and the City harmless from and against any claims, losses, liabilities, damages or expenses (including attorney fees) suffered or incurred by the DDA and/or the City which are based upon or result from any acts or omissions of the Developer, its employees, agents, subcontractors or business invitees in the design, construction, maintenance, occupancy, use or operation of the PUD.

5. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their permitted successors and assigns.

6. The signatories on behalf of the parties hereto hereby represent and warrant to the other parties hereto that they are duly authorized to execute and deliver this Agreement on

behalf of such party and that this Agreement is binding upon and enforceable against such party.

7. All notices permitted or required under this Agreement shall be in writing and addressed to the parties at their addresses set forth above. Any such notice shall be sent by certified mail, return receipt requested, express overnight delivery requiring a signed delivery receipt, delivered personally or sent by facsimile. Any notice sent by certified mail, return receipt requested, shall be deemed delivered on the third (3rd) business day after mailing. Any notice sent by express overnight delivery shall be deemed delivered on the following business day after delivering such notice to the carrier. Any notice given by personal delivery or by facsimile prior to 5:00 p.m. shall be deemed delivered on the date of such delivery or, if 5:00 p.m. or later, on the next business day. Any notice which a party fails or refuses to accept shall be deemed delivered on the date of such failure or refusal. The parties hereto may change their addresses for notice purposes by a notice sent in accordance with the provisions of this Agreement, but no such address shall be a post office box.

8. This Agreement shall be interpreted and construed in accordance with the laws of the State of Michigan.

9. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original but all of which together shall constitute but one and the same Agreement.

10. This Agreement constitutes the entire Agreement between the parties hereto pertaining to the subject matter hereof and supersedes all negotiations, preliminary agreements and prior to contemporaneous discussions and understandings of the parties hereto in connection with the subject matter hereto.

11. No amendment, change or modification of any of the terms, provisions or conditions of this Agreement shall be effective unless made in writing and signed or initialed on behalf of the parties hereto by their duly authorized representatives.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

DEVELOPER:

SYNDECO REALTY CORPORATION,
a Michigan corporation

By:_____
Printed Name: Paul W. Potter
Its: President

DDA:

ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY, a public corporation under Act 197, 1975 Public Acts

By:_____
Printed Name: Lorri Sipes
Its: Chairman

EXHIBIT "A"

PUD LEGAL DESCRIPTION

Commencing at the Northeast corner of Block 4 South, Range 3 East, "Original Plat of the Village (now City) of Ann Arbor", Washtenaw County, Michigan, as recorded in Transcripts, pages 152 and 153, Washtenaw County Records; thence S 00°10'30" E 95.67 feet along the East line of said Block 4 and the West line of South Main Street to the POINT OF BEGINNING; thence continuing S 00°10'30" E 351.73 feet along said East line and said West line; thence S 89°50'00" W 263.06 feet to a point on the West line of said Block 4 and the East line of South Ashley Street; thence N 00°16"10" W 297.00 feet along said West line and said East line; thence N 89°50'00" E 115.24 feet; thence N 00°12'45" W 54.73 feet; thence N 89°50'00" E 148.34 feet to the Point of Beginning. Being Lots 4, 5, 6, 11, 12, 13 and 14 and a part of Lots 2, 3, 7, 10 and 15, and a part of a vacated alley, all in Block 4 South, Range 3 East of said "Original Plat of the Village (now City) of Ann Arbor".

EXHIBIT "B"

OPTION AGREEMENT

EXHIBIT "C"

PEDESTRIAN IMPROVEMENTS

		QUANTITY/UNIT
MAIN STREET		
Site Improvement	Concrete Sidewalk	2810 SF
	Brick Pavers	1976 SF
	Concrete Curb and Gutter	375 LF
	Bike Hoops	6 EA
Landscaping	Large Trees (3 ½" caliper)	8 EA
	Seed and Mulch	888 SF
	Planters 6'x10'x12' high	4 EA
	Irrigation at Beds and Planters	1
	Tree Lights	1 LF
ASHLEY STREET		
Site Improvement	Concrete Sidewalk	1426 SF
	Brick Pavers	50 SF
	Concrete Curb and Gutter	343 LF
Landscaping	Large Trees (3 ½" caliper)	9 EA
	Seed and Mulch	320 SF
	Irrigation at Beds and Planters	1
OUTDOOR SEATING AREA		
Site Improvements	Stairs at Plaza	305 LF
	Handrails at Site Stairs	30 LF
	Brick Pavers	2154 SF
	Waterproofing at Plaza	2154 SF
	Planter Wall	104 LF
	Trash Receptacles	1 EA
	Benches	2 EA
Landscaping	Large Trees (3 ½" caliper)	3 EA
	Planting Beds	240 SF
	Irrigation at Beds and Planters	1

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MEWS WORK		QUANTITY/UNIT
Site Improvements	Site Stairs	225 LF
	Handrails at Site Stairs	45 LF
	Concrete Sidewalk	324 SF
	Brick Pavers	7641 SF
	Granite Curbs	195 LF
	Planter Wall	236 LF
	Trash Receptacles	5 EA
	Benches	4 EA
Landscaping	Large Trees (3 ½" caliper)	12 EA
	Planting Beds	3120 SF
	Seed and Mulch	3970 SF
	Trellis	616 SF
	Bushes	850 LF
	Irrigation at Beds and Planters	1
	Decorative Lights	12 EA

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EXHIBIT "D"

PUD DEVELOPMENT AGREEMENT

EXHIBIT "E"

PARKING PERMIT AGREEMENT

EXHIBIT "F"

EASEMENT AGREEMENT

EXHIBIT "G"

ADDENDUM TO PARKING STRUCTURE AGREEMENT

ASHLEY MEWS PARKING AGREEMENT

PARKING PERMIT AGREEMENT

THIS PARKING PERMIT AGREEMENT ("Agreement") made and entered into this 12th day of ~~April~~ June, 2000 is by and between **SYNDECO REALTY CORPORATION**, a Michigan corporation, whose address is 660 Plaza Drive, Suite 2300, Detroit, Michigan 48226 ("Developer"), **ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY**, a public corporation organized and existing pursuant to Act 197, Public Acts of Michigan, 1975, whose address is 100 North Fifth Avenue, P.O. Box 8647, Ann Arbor, Michigan 48107 ("DDA") and the **CITY OF ANN ARBOR**, a Michigan municipal corporation, whose address is 100 North Fifth Avenue, Ann Arbor, Michigan 48104 (the "City").

PRELIMINARY STATEMENT

Developer proposes to construct a mixed-use development of residential, retail and office uses on the property described in Exhibit "A", attached hereto and made a part hereof by reference thereto ("Property"). Developer has applied to the City for approval of the Ashley Mews Planned Unit Development ("PUD") to accommodate the construction of such mixed uses within one (1) unified and cohesive development in a manner and with a physical configuration that optimizes the use of the Property. The Property is located within the Downtown Area and the City Planning Commission has determined during a public hearing on the PUD that it is desirable to develop the Property in the manner described above.

As part of an Option Agreement with the City ("Option Agreement"), Developer proposes to acquire part of the Property from the City and, in turn, sell to the City (or its designee) eight (8) residential units ("Units") to be resold by the City (or its designee) for "affordable housing" upon such terms and conditions as the City (or its designee), in its sole and absolute discretion, shall determine.

As part of a Development Agreement between the Developer and the DDA (the "Syndeco Development Agreement"), the Developer is making specified commitments to the DDA regarding the construction of the PUD and the DDA is making specified financial commitments to the Developer relating to that construction.

As a condition to the commitments of the Developer under the Syndeco Development Agreement, the DDA has committed to the Developer to make available for use by occupants of the PUD specified parking in the Williams & Fourth Street Parking Structure owned by the City and managed by the DDA (the "Structure").

NOW, THEREFORE, in consideration of the mutual promises contained herein, and other good and valuable consideration, receipt whereof is hereby severally acknowledged, the Developer, the DDA and the City hereby agree as follows:

1. Subject to the conditions specified in Section 2, the DDA will make parking available at the Structure upon the following terms and conditions:

(a) The term during which the parking will be made available at the Structure (the "Term") will be for a period of twenty (20) years, beginning on the date specified by Developer by written notice to the DDA, which notice shall be delivered by the Developer

to the DDA not less than one hundred twenty (120) days prior to the first day of the Term. The Developer will use good faith efforts to advise the DDA of the projected commencement date of the Term at least six (6) months prior to that effective date.

(b) During the Term, the DDA will issue to the Developer parking permits (the "Permits") for one hundred (100) spaces at the Structure, subject to the right of the Developer, at any time and from time to time, to reduce the number of Permits by delivery of notice to the DDA at least one hundred twenty (120) days prior to the effective date of such reduction. The Developer acknowledges, however, that unless otherwise agreed in writing by DDA, any such reduction will be permanent and that the Developer will not have the right to require a restoration of the Permits eliminated by reason of any such reduction.

(c) The Permits issued to the Developer by the DDA for the Structure will be available for use only by individuals who for the periods to which the Permits apply are residential occupants of the PUD or by individuals who for the period to which the Permits apply are employees of businesses which are business occupants of the PUD (the "Permit Holders"). The Developer, on or before the first day of the Term, shall provide a schedule to the DDA of each Permit Holder and the vehicle for which the Permit will be utilized (a "Permit Schedule"). On a quarterly basis thereafter, not later than the thirtieth (30th) day of each calendar quarter, the Developer shall deliver to the DDA an update of the Permit Schedule of the Permit Holders as of the first (1st) day of that calendar quarter. (If as of the date of any Permit Schedule, any Permit is not assigned for use by a specific Permit Holder, then the Developer shall confirm that fact in such Permit Schedule and, promptly after that Permit is assigned to a specific Permit Holder, shall supplement the Permit Schedule with the name of that Permit Holder to whom that Permit is assigned and the vehicle for which that Permit will be utilized.) Each Permit Holder, in the use of the Structure, will comply with all applicable ordinances of the City and will comply with all rules and regulations adopted by the DDA for use of the Structure to the extent that such rules and regulations are applicable to all holders of Permits for the Structure and such rules and regulations have been furnished by the DDA to the Developer.

(d) The Developer shall pay to the DDA the following fees for each Permit issued under this Agreement (the "Permit Fee"): (i) an initial fee for the issuance of a card required to obtain access under the Permit and (ii) a monthly fee for each calendar month during which the Permit is issued. The Permit Fees will equal the then prevailing rates for parking permits at the Structure. The DDA, not later than sixty (60) days prior to the commencement of the Term, shall advise the Developer in writing of the then prevailing rates which will provide the basis for the Permit Fees. The DDA will have the right, from time to time during the Term, to revise the Permit Fees payable by the Developer under this Agreement to correspond to authorized changes in the then prevailing rates by a written notice delivered at least sixty (60) days prior to the effective date of such revision. For purposes of this Agreement, the prevailing rate for a parking space in the Structure will be the rate generally charged to individuals an arm's length basis for monthly parking permits in the Structure. If no other monthly parking permits are issued for the Structure, then the prevailing rate will be the rate which is charged for monthly parking permits in the parking structure operated by the DDA or the City which is nearest the Structure.

(e) The Developer shall pay to the DDA the Permit Fees for each Permit issued under this Agreement on a monthly basis, not later than the first day of the calendar month immediately preceding the calendar month for which such Permit is issued. (For example, for Permits applicable to the month of August, the payment by the Developer shall be made to the DDA on or before the immediately preceding July 1st.) The Permit Fee for each calendar month will be payable for all Permits issued by the DDA under this Agreement for that month, irrespective of whether the Developer has assigned that Permit to a Permit Holder for use during that month and irrespective of whether the Permit Holder has reimbursed the Developer for that Permit Fee. Any Permit Fee not paid by the Developer on or before its due date will bear interest at the prime rate (as published by Comerica Bank or its successor) plus three percent (3%) from its due date to its date of payment.

If during the Term, renovations or repairs are required to the Structure, the DDA shall use its best efforts to minimize the effect of such repairs or renovations upon the utilization of the Permits issued under this Agreement. If, despite such best efforts, the utilization of some or all of those Permits must be temporarily suspended, then the DDA shall use its best efforts to arrange for alternative parking arrangements for the affected Permit Holders at the nearest available locations. If during the Term, the DDA permanently discontinues parking at the Structure, then the DDA shall give written notice to the Developer as far in advance as possible of such discontinuance and shall use its best efforts to provide alternative parking for the affected Permit Holders at other locations.

2. Conditions to Effectiveness. The commitment of the DDA to issue Permits to the Developer for the Structure on the terms specified in Section 1 is subject to the satisfaction (or waiver in writing by the DDA) of each of the following conditions on or before the following dates:

(a) The Developer shall have satisfied each of its commitments under the Syndeco Development Agreement on or before the date specified for satisfaction of such commitment in the Syndeco Development Agreement; and

(b) The Developer, by written notice to the DDA pursuant to Section 1(a), shall have activated the Term of this Agreement as of a date on or before November 30, 2002.

Unless each of the above conditions is satisfied on or before the date specified above for such condition, then all rights and obligations of the DDA and the Developer in this Agreement shall be null, void and of no further force or effect.

3. Default/Termination. The following will constitute events of default by the Developer under this Agreement:

(a) The failure by the Developer to pay any Permit Fees within thirty (30) days after the date for payment specified in Section 1(e); or

(b) The breach by the Developer of any commitment under this Agreement and the failure to remedy that breach within thirty (30) days after the date that the DDA delivers written notice identifying such breach and demanding such remedial action.

Upon the occurrence of an event of default, the DDA, by further written notice to the Developer, may terminate this Agreement effective thirty (30) days following the day of delivery of such notice. In such event, the obligation of the DDA to issue Permits for the Structure will terminate as of the effective date of such termination, the Developer will remain liable to the DDA for all Permit Fees accrued under this Agreement through the effective date of termination and the Developer will remain liable to the DDA for any damages incurred by the DDA or the City as a result of such default; provided, however, that any claims by the DDA for lost revenues (as distinguished from other damages which may be incurred by the DDA) due to Developer's failure to utilize and pay for Permits issuable pursuant to this Agreement will be limited to accrued but unpaid Permit Fees through the effective date of termination plus the total of all Permit Fees for a period of one hundred twenty (120) days after the date of termination for the number of Permits in effect on the date of termination plus any interest accruing thereon in accordance with Section 1(e).

4. Assignment. Developer shall make no assignment under this Agreement without the prior written consent of DDA, which consent shall not be unreasonably withheld, delayed or conditioned; provided, however, that the Developer may assign its rights under this Agreement to Ashley Mews, L.L.C. and/or Syndeco Plaza, L.L.C., each of which is a Michigan limited liability company and is controlled by Developer. In the event of any such permitted assignment, (a) Developer shall notify the DDA of the assignment in advance and in writing, (b) Developer, Ashley Mews, L.L.C. and/or Syndeco Plaza, L.L.C. will each individually be fully liable for the performance of the obligations of the Developer under this Agreement and (c) the document of assignment shall specifically confirm the joint liability described in Subsection 4 (b).

5. City Confirmation. The City acknowledges and consents to the terms of this Agreement and confirms that the execution of this Agreement by the DDA and the performance by the DDA of its obligations under this Agreement does not and will not create any default by the DDA under the Master Lease. Except as stated below in Section 6, the City shall have no obligations under this Agreement to the Developer.

6. City Assumption of DDA Rights and Obligations. If the DDA management responsibility for the Structure is for any reason terminated, whether as a result of the termination or amendment of the Master Lease, the DDA is dissolved by action of the City or operation of law, or any other reason, the rights and obligations of the DDA under this Agreement shall transfer to and become the obligation of the City and the Developer's rights and obligations under this Agreement will not be affected in any way by the transfer of the rights and obligations to the City.

7. Binding Effect. This Agreement is binding upon and shall inure to the benefit of the parties hereto and their permitted successors and assigns.

8. Notices. All notices permitted or required under this Agreement shall be in writing and addressed to the parties at their addresses set forth above. Any such notice shall be sent by certified mail, return receipt requested, express overnight delivery requiring a signed delivery receipt, delivered personally or sent by facsimile. Any notice sent by certified mail,

return receipt requested, will be deemed delivered on the third (3rd) business day after mailing. Any notice sent by express overnight delivery will be deemed delivered on the following business day after delivering such notice to the carrier. Any notice given by personal delivery or by facsimile prior to 5:00 p.m. will be deemed delivered on the date of such delivery or, if 5:00 p.m. or later, on the next business day. Any notice which a party fails or refuses to accept will be deemed delivered on the date of such failure or refusal. The parties hereto may change their addresses for notice purposes by a notice sent in accordance with the provisions of this Agreement, but no such address shall be a post office box.

9. Authority. The signatories on behalf of the parties hereto hereby represent and warrant to the other parties hereto that they are duly authorized to execute and deliver this Agreement on behalf of such party and that this Agreement is binding upon and enforceable against such party.

10. Applicable Law. This Agreement shall be interpreted and construed in accordance with the laws of the State of Michigan.

11. Counterparts. This Agreement may be executed in one or more counterparts, each of which will be deemed an original but all of which together shall constitute but one and the same Agreement.

12. Entire Agreement. This Agreement constitutes the entire Agreement between the parties hereto pertaining to the subject matter hereof and supersedes all negotiations, preliminary agreements and prior to contemporaneous discussions and understandings of the parties hereto in connection with the subject matter hereto.

13. Amendments. No amendment, change or modification of any of the terms, provisions or conditions of this Agreement will be effective unless made in writing and signed or initialed on behalf of the parties hereto by their duly authorized representatives.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

DEVELOPER:

SYNDECO REALTY CORPORATION,
a Michigan corporation

By: _____
Printed Name: Paul W. Potter
Its: President

DDA:

ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY, a public corporation pursuant to Act 197, Public Acts of Michigan 1975

By: Lorri D Sipes
Printed Name: Lorri Sipes
Its: Chairman
and

By: Susan Pollay
Susan Pollay, Secretary

CITY:

CITY OF ANN ARBOR
a Michigan municipal corporation

By: Ingrid B. Sheldon
Ingrid B. Sheldon, Mayor

and

By: Yvonne Carl
~~W. Northcross~~, City Clerk
Yvonne Carl, Interim

APPROVED AS TO SUBSTANCE:

By: N B L 6.8.01
Neal G. Berlin, City Administrator

APPROVED AS TO FORM:

By: Abigail Elias 6-8-01
Abigail Elias, City Attorney

EXHIBIT "A"

PUD LEGAL DESCRIPTION

Commencing at the Northeast corner of Block 4 South, Range 3 East, "Original Plat of the Village (now City) of Ann Arbor", Washtenaw County, Michigan, as recorded in Transcripts, pages 152 and 153, Washtenaw County Records; thence S 00°10'30" E 95.67 feet along the East line of said Block 4 and the West line of South Main Street to the POINT OF BEGINNING; thence continuing S 00°10'30" E 351.73 feet along said East line and said West line; thence S 89°50'00" W 263.06 feet to a point on the West line of said Block 4 and the East line of South Ashley Street; thence N 00°16"10" W 297.00 feet along said West line and said East line; thence N 89°50'00" E 115.24 feet; thence N 00°12'45" W 54.73 feet; thence N 89°50'00" E 148.34 feet to the Point of Beginning. Being Lots 4, 5, 6, 11, 12, 13 and 14 and a part of Lots 2, 3, 7, 10 and 15, and a part of a vacated alley, all in Block 4 South, Range 3 East of said "Original Plat of the Village (now City) of Ann Arbor".

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ASHLEY MEWS PLANNED UNIT DEVELOPMENT (PUD) AGREEMENT

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12/03/1999 02:37P
Peggy M. Haines - Washtenaw Co. AG
L-3917 P-880

ASHLEY MEWS PUD DEVELOPMENT AGREEMENT

THIS AGREEMENT, made this 18th day of October, 1999, by and between the City of Ann Arbor, a Michigan Municipal Corporation, hereinafter called the CITY, with principal address at 100 North Fifth Avenue, Ann Arbor, Michigan 48107, and Ashley Mews, LLC, a Michigan limited liability company, with principal address at 660 Plaza Drive, Suite 2300, Detroit, Michigan 48226, hereinafter called the PROPRIETOR, witnesses that:

WHEREAS, the PROPRIETOR owns certain land in the City of Ann Arbor, described below and site planned as the Ashley Mews PUD (Planned Unit Development), and

WHEREAS, the PROPRIETOR has caused certain land in the City of Ann Arbor, described below, to be surveyed, mapped and site planned as Ashley Mews PUD, and desires PUD site plan approval thereof, and

WHEREAS, the PROPRIETOR desires to build or use certain public improvements with and without the necessity of special assessments by the CITY, and

WHEREAS, the CITY desires to insure that all of the customary municipal improvements required by pertinent CITY ordinances and regulations be properly made, and that the PROPRIETOR will install these improvements prior to any occupancy permits being issued.

THE PROPRIETOR HEREBY AGREES

(P-1) To prepare and submit to the CITY for approval six copies of detailed plans and specifications ("the Plans") prepared by a registered professional engineer for construction of private storm sewers and storm water management system, public water main, and public sidewalks, including but not limited to the sidewalk referenced in P-4, below, and streetlights with the understanding that no work on said improvements shall be commenced until the Plans have been approved by the City Administrator or designee, and to provide such other relevant information to CITY departments as shall be reasonably required.

(P-2) To construct all improvements set forth in Paragraph P-1 of this Agreement in accordance with the approved Plans and to repair all defects in the public improvements which develop within one year from the date of acceptance thereof by the CITY. If the PROPRIETOR fails to construct the improvements, the CITY may send notice via first class mail to the PROPRIETOR at the address listed above requiring it to commence and complete the improvements in the notice within the time set forth in the notice. The CITY may cause the work to be completed at the expense of the PROPRIETOR if the work is not completed by the PROPRIETOR within the time set forth in the notice. The cost of the work shall be a lien on the Property and may be collected as a single lot assessment as provided in Chapter 13 of the Ann Arbor City Ordinances.

(P-3) To cause to be maintained Public Liability Insurance and Property Damage Insurance in the minimum amount of $1,000,000 per occurrence and naming the CITY as named insured to protect and

indemnify the CITY against any claims for damage due to public use of sidewalks in the development prior to final written acceptance by the CITY of the sidewalks, including but not limited to the sidewalk referenced in P-4, below. Evidence of such insurance shall be provided to the City Clerk's Office before the issuance of any permits and shall remain in full force and effect during construction and until notice of acceptance of the public improvements by the CITY.

(P-4) To convey to the CITY, before issuance of the first building permit (except for demolition permits), a perpetual easement of not less than 6,800 square feet in area and located approximately as illustrated on Exhibit A (attached), in which area PROPRIETOR shall construct a sidewalk. The easement shall allow cross-site continuous access for pedestrians between South Main and South Ashley Streets upon acceptance of the sidewalk by the CITY. This sidewalk shall be maintained in perpetuity by the developer or successor condominium association.

(P-5) The Ashley Mews PUD shall be built in a single phase, by initially commencing the site work and infrastructure for the entire PUD. Construction of the high-rise and low-rise components shall be sequenced in accordance with good construction practice, except that no certificates of occupancy for either component may be granted until building permits have been obtained and construction beyond the initial site and infrastructure work has commenced for the other component.

(P-6) For the benefit of the residents of the PROPRIETOR'S development, to make a park contribution of $22, 400.00 to the CITY Parks and Recreation Department for improvements to Wurster Park prior to the issuance of building permits.

(P-7) To create an association composed of all owners of Ashley Mews PUD, membership in which shall be required by covenants and restrictions in the recorded Master Deed. The association shall be responsible for insuring perpetual maintenance and ownership of the landscape materials, exterior lighting, seating structures, driveways, on-site storm water management system, and all other common elements.

(P-8) After construction of the private on-site storm water management system, to maintain it until non-developer co-owners elect one or more directors to the Association's board of directors. Thereafter, by provision in the master deed for the Ashley Mews PUD, the Association shall own and maintain the storm water management system. Any proposed changes to the storm water management system must be approved by the Building Department. If the PROPRIETOR or Association, as appropriate, fails to maintain the detention areas, the CITY may send notice via first class mail to the PROPRIETOR, or Association, at the address listed above, requiring it to commence and complete the maintenance stated in the notice within the time set forth in the notice. The CITY may cause the work to be completed at the expense of the PROPRIETOR or Association if the work is not completed by the PROPRIETOR or Association, as appropriate, within the time set forth in the notice. Every owner of a portion of the property, including co-owners of condominium units, shall pay a pro-rata share of the cost of the maintenance work. That portion of the cost of the maintenance work attributable to each lot or condominium unit shall be a lien on that Property and may be collected as a single lot assessment as provided in Chapter 13 of the City of Ann Arbor Code of Ordinances.

(P-9) To obtain, prior to issuance of the first building permit (except for demolition permits) for the low-rise component as shown on Exhibit A (attached), a Conditional Letter of Map Revision Based on Fill (CLOMR-F) from the Federal Emergency Management Agency (FEMA) and to provide a copy to the CITY, or, in the alternative, to apply for and receive approval of an amended site plan that eliminates the unit(s) which, if built, would require revision of the FEMA map. Prior to the issuance of a certificate of occupancy for any unit in the low-rise component, the PROPRIETOR shall obtain a Letter of Map Revision Based on Fill (LOMR-F) from FEMA for completed changes in the floodplain elevation and furnish a copy to the CITY, unless PROPRIETOR has applied for and received approval of an amended site plan that eliminates the unit(s) which, if built, would require revision of the FEMA map.

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Peggy M. Haines - Washtenaw Co. AG
L-3917 P-880

(P-10) To prepare and submit to the Planning Department one copy of the Master Deed prior to issuance of building permits, with the exception that demolition permits may be issued to PROPRIETOR before delivery of a copy of the Master Deed to the Planning Department.

(P-11) PROPRIETOR represents to the CITY and warrants that PROPRIETOR is the sole title holder in fee simple of the land described below except for any mortgage, easements and deed restrictions of record and that the persons signing below on behalf of PROPRIETOR have legal authority and capacity to enter into this agreement for PROPRIETOR.

(P-12) This agreement shall be interpreted, enforced and governed under the laws of the State of Michigan and City of Ann Arbor Code of Ordinances.

(P-13) PROPRIETOR acknowledges that failure to comply with the above paragraphs may result in a stop work order for any previously-issued building permits and be grounds for the CITY to deny issuing building permits, certificates of occupancy, or permits of any kind until satisfactory completion of the above paragraphs.

(P-14) To pay for the cost of recording this document with the Washtenaw County Register of Deeds.

THE CITY HEREBY AGREES:

(C-1) In consideration of the above undertakings, to approve the Ashley Mews PUD site plan.

(C-2) To use the park contribution described above for improvements to Wurster Park.

(C-3) To provide timely and reasonable CITY inspections as may be required during construction.

(C-4) To record this agreement with the Washtenaw County Register of Deeds.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals the day first above written. This agreement is not intended to create a contractual right for third parties. It may be enforced, amended, or rescinded only by the parties and their successors in interest. The obligations of the PROPRIETOR contained in this agreement shall be binding on the successors and assigns in ownership of the following-described parcels:

Commencing at the Northeast corner of Block 4 South, Range 3 East, "Original Plat of the Village (now City) of Ann Arbor," Washtenaw County, Michigan, as recorded in Transcripts, pages 152 and 153, Washtenaw County Records; thence S 00°10'30" E 95.67 feet along the East line of said Block 4 and the West line of South Main Street to the POINT OF BEGINNING; thence continuing S 00°10'30" E 351.73 feet along said East line and said West line; thence S 89°50'00" W 263.06 feet to a point on the West line of said Block 4 and the East line of South Ashley Street; thence N 00°16'10" W 297.00 feet along said West line and said East line; thence N 89°50'00" E 115.24 feet; thence N 00°12'45" W 54.73 feet; thence N 89°50'00" E 148.34 feet to the Point of Beginning. Being Lots 4, 5, 6, 11, 12, 13 and 14 and a part of Lots 2, 3, 7, 10 and 15, and a part of a vacated alley, all in Block 4 South, Range 3 East of said "Original Plat of the Village (now City) of Ann Arbor" and containing 1.98 acres of land, more or less. Begin subject to easements and restrictions of record, if any.
(Assessor's Parcel Nos. 09-24-411-006, 015, 021, 022, 035, 035)

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CITY OF ANN ARBOR
100 North Fifth Avenue
Ann Arbor, Michigan 48107

Witnesses:

Alexis Marcarello
ALEXIS MARCARELLO

Alexis Marcarello
ALEXIS MARCARELLO

By: Ingrid B. Sheldon
Ingrid B. Sheldon, Mayor

By: N. Northcross
W. Northcross, City Clerk

Approved as to Substance:

11.29.99
Neal G. Berlin, City Administrator

Approved as to Form:

11-24-99
Abigail Elias, City Attorney/KDL

ASHLEY MEWS LLC

By Syndeco Realty Corporation
A Michigan Corporation
Its Member

By: Paul W. Potter
Paul W. Potter
Its President

Witnesses:

Carrie L. Persons
Carrie L. Persons

Scott E. Munzel
Scott E. Munzel

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STATE OF MICHIGAN)
) ss:
County of Washtenaw)

On this 3rd day of December, 1999, before me personally appeared Ingrid B. Sheldon, Mayor, and W. Northcross, Clerk of the City of Ann Arbor, a Michigan Municipal Corporation, to me known to be the persons who executed this foregoing instrument, and to me known to be such Mayor and Clerk of said Corporation, and acknowledged that they executed the foregoing instrument as such officers as the free act and deed of said Corporation by its authority.

Laurie Grimston Hogan

NOTARY PUBLIC
Washtenaw County, Michigan
My Commission Expires: _____

LAURIE GRIMSTON HOGAN
Notary Public, Washtenaw County, MI
My Commission Expires Nov 29, 2002

STATE OF MICHIGAN)
) ss:
County of Washtenaw)

On this 19th day of November, 1999, before me personally appeared Paul W. Potter, President of Syndeco Realty Corporation, Member of Ashley Mews LLC, to me known to be the person who executed the foregoing instrument, and acknowledged that he executed the foregoing instrument as his free act and deed.

Carrie L. Persons

CARRIE L. PERSONS
NOTARY PUBLIC – WASHTENAW COUNTY, MI
MY COMMISSION EXPIRES 11/15/2000

NOTARY PUBLIC
Washtenaw County, Michigan
My Commission Expires: _____

DRAFTED BY: Karen Popek Hart, Planning Director
Ann Arbor City Planning Department
Post Office Box 8647
Ann Arbor, Michigan 48107
(734) 994-2800

10/18/99
DJ/lhf

5

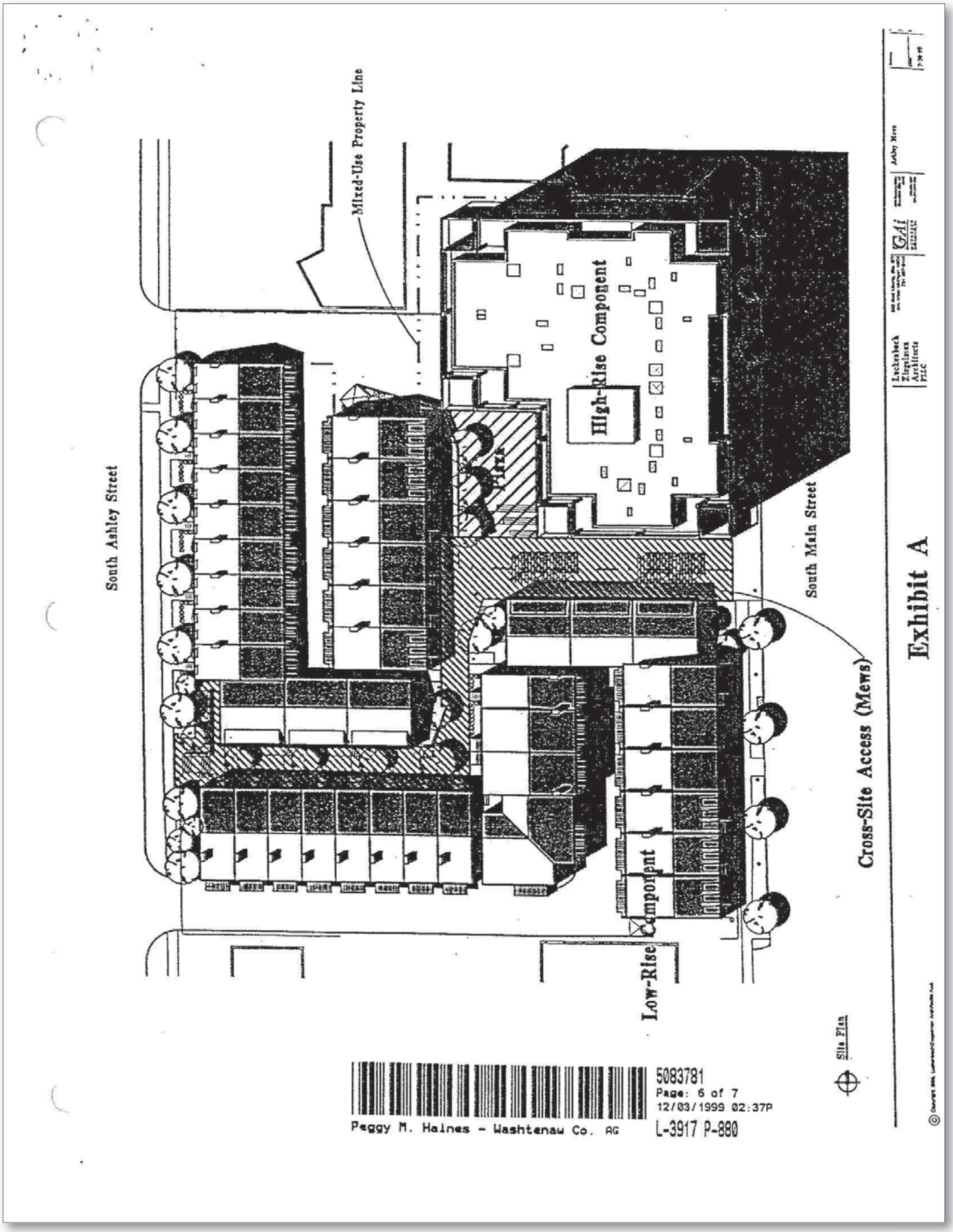
Exhibit A
Site Plan
Mixed-Use Property Line
High-Rise Component
Low-Rise Component
South Ashley Street
South Main Street
Cross-Site Access (Mews)
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EXHIBIT B

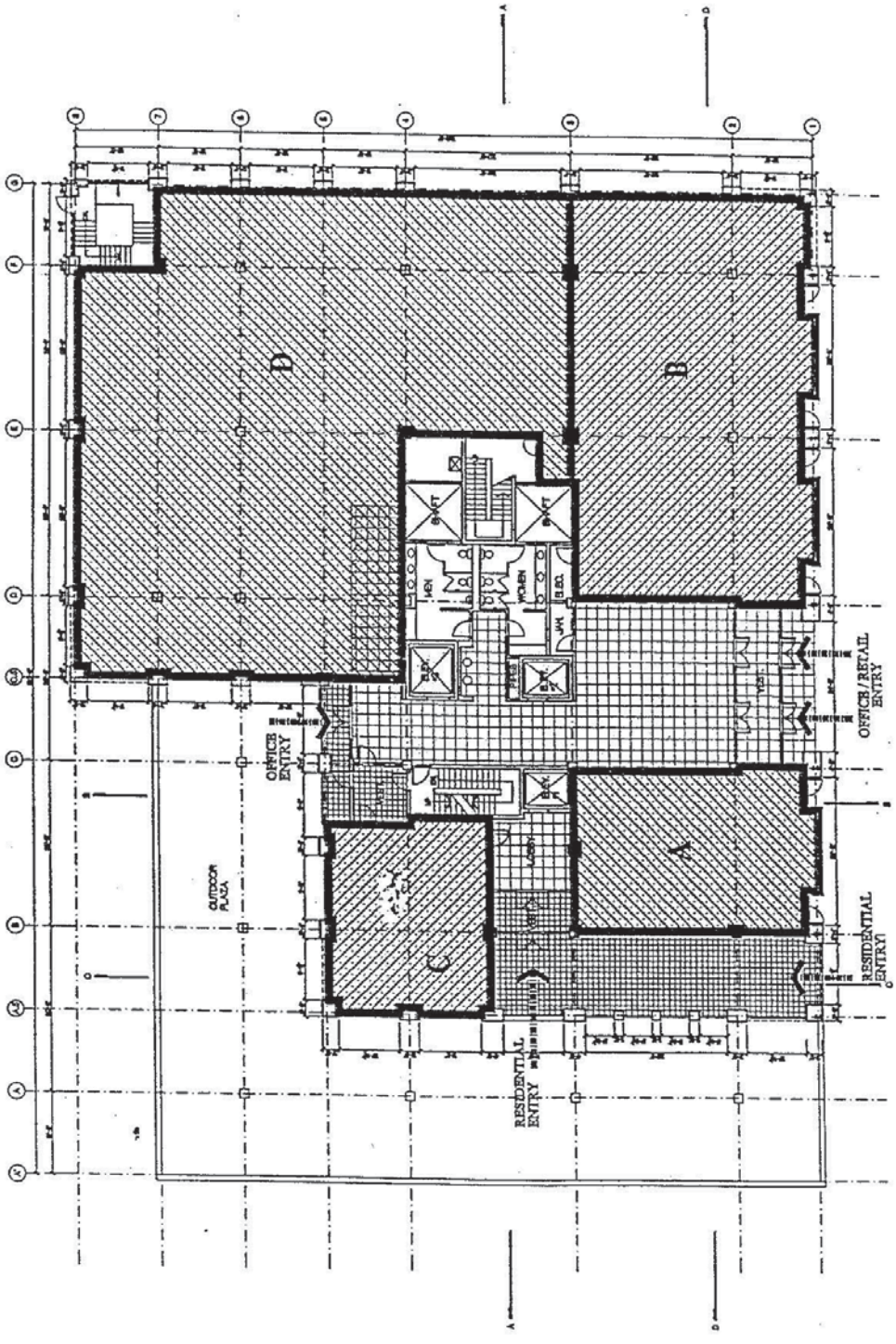

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EXHIBIT "E"

PARKING PERMIT AGREEMENT

VILLAGE GREEN PARKING AGREEMENT

CITY OF ANN ARBOR, MICHIGAN
100 North Fifth Avenue, P.O. Box 8647, Ann Arbor, Michigan 48107-8647
Phone (734) 994-2670
FAX (734) 994-4954
http://www.a2gov.org

Office of The City Attorney

October 12, 2007

RECEIVED
OCT 17 2007
Ann Arbor
Downtown Development Authority

Susan Pollay
Executive Director
Downtown Development Authority
150 S. Fifth Avenue, Suite 301
Ann Arbor, MI 48104

Dear Susan:

Enclosed for your records is one fully executed copy of the Parking Agreement between the City of Ann Arbor and Village Green Residential Properties, L.L.C. I have also enclosed a copy of the approved City Council Resolution authorizing the execution of the Agreement.

Copies of the documents have been provided to legal counsel for Village Green and are on file with the City Clerk.

With the approval and execution of the Parking Agreement this pre-requisite to exercising Village Green's Option Agreement with the City is completed. The remaining pre-requisites must be completed by February 2008, unless an extension is granted by the City Administrator as provided under the Option terms.

Thank you for continued assistance in bringing this Project to closing.

Sincerely,

Mary Joan Fales
Senior Assistant City Attorney

Enc. (2)

recycled paper

PARKING AGREEMENT

The CITY OF ANN ARBOR, 100 North Fifth Avenue, P.O. Box 8647, Ann Arbor, Michigan 48107-8647 (hereinafter "CITY"), the ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY, 150 South Fifth Avenue, Suite 301, Ann Arbor, Michigan 48104 (hereinafter "DDA"), and the VILLAGE GREEN RESIDENTIAL PROPERTIES, L.L.C. 30833 Northwestern Highway, Suite 300, Farmington Hills, Michigan 48334 (hereinafter "VILLAGE GREEN"), in consideration of the mutual promises contained herein, agree as follows this 3 day of October 2007:

1. Factual Background

A. The CITY requested proposals for the redevelopment of City-owned property located at First and Washington Streets in Ann Arbor for the purpose of providing residential units and public parking facilities.

B. VILLAGE GREEN has been determined by the CITY to be the appropriate developer of said units and facilities, which will be developed within a single structure (hereinafter "the Project") with the parking facilities below and the residential units above.

C. The CITY will acquire said parking facilities after they have been constructed by VILLAGE GREEN pursuant to required CITY reviews and inspections.

D. The DDA has agreed to contribute funds toward the acquisition of said parking facilities, and will manage said facilities pursuant to agreement with the CITY after construction is completed.

E. The CITY will permit VILLAGE GREEN to occupy a specified number of spaces in said parking facilities for parking and storage during construction of said residential units, and thereafter for use by occupants of said residential units. It is the expectation of the parties that the parking facilities will be completed prior to completion of the residential units.

F. The purpose of this Parking Agreement is to specify the conditions for construction, conveyance, financing and use of said parking facilities.

2. Construction of Parking Facilities

A. Plans and Specifications. VILLAGE GREEN will submit plans for the project for review by the CITY pursuant to City Planned Unit Development ordinances, regulations and administrative procedures. Prior to submission of said plans, VILLAGE GREEN will confer with the CITY and the DDA regarding details of the Project. The parking facilities shall contain no fewer than 205 spaces (although it is anticipated by all the parties that final design submitted for review and approval will allow for a range of 230-260 parking spaces and the interconnection of all parking decks), provide for bicycle parking and storage as specified in the City site plan requirements, and alternate transportation users short term (i.e., zip car) parking, be designed and constructed for a minimum useful life of 75 years (i.e., number of years before first major structural repair required) with maximum protection against salt degradation. Plans and Specifications for Project shall be mutually agreed upon between VILLAGE GREEN and the

DDA, provided that at a minimum such plans and specifications shall meet or exceed applicable standards set forth in the *Guide for Design of Durable Parking Structures,* American Concrete Institute (ACI) 362.

B. Insurance and Indemnity. VILLAGE GREEN will procure or cause to be procured insurance satisfactory to the CITY and the DDA insuring the CITY and the DDA from liability for damage to person or property or contractual liability arising in whole or in part from action or inaction by, or in behalf of, VILLAGE GREEN in the construction of the Project. VILLAGE GREEN will indemnify and hold the CITY and the DDA harmless from any such liability.

VILLAGE GREEN shall take all necessary and reasonable precautions to protect the safety of the public during construction. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with the construction of the parking facilities. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to or caused by agents or employees of the City. VILLAGE GREEN shall obtain and maintain sufficient insurance to cover damage to itself, its contractors and any City property at the site by any cause.

3. Transfer of Ownership

A. The Project will be developed as a condominium, with one unit consisting of the Project's residential units and a second unit consisting of the parking facilities, with general common elements (i.e., stairwells, elevators/elevator lobby areas, and similar shared space and/or systems) Necessary condominium documents setting forth the particulars of each condominium units, shared general common elements and the rights and responsibilities of each of the condominium owners will be prepared by the CITY and/or the DDA, in consultation with VILLAGE GREEN and shall be subject to necessary approvals of all parties. VILLAGE GREEN agrees to reimburse the City and/or the DDA for all legal costs incurred by the CITY, including without limitation in-house City legal staff costs and outside legal counsel fees, in preparation of the condominium documents. Each party agrees to take all reasonable steps to minimize costs and fees in the preparation of condominium documents by assigning and/or engaging experienced legal counsel/surveyors/engineers/project personnel in complex condominium projects. VILLAGE GREEN agrees to establish a project retainer for legal costs in an amount not less than $40,000.00 to be expensed against and/or reimburse the City for costs and fees. If the established project retainer is determined prior to the transfer of ownership to be inadequate by the City, on receipt of written notice of such inadequacy and reasons for it, VILLAGE GREEN agrees it will, within thirty (30) days of notice, increase the then current balance of the project retainer to cover the existing or anticipated shortfall. VILLAGE GREEN shall be entitled to any remainder of the project retainer after all City and/or DDA costs have been reimbursed.

B. Ownership of the parking facilities will be transferred to the CITY, by assignment to the CITY of the appropriate condominium unit, upon substantial completion of those facilities, substantial completion occurring when (i) the parking facilities are completed in all material respects in accordance with approved plans and specifications, excluding only punch list items

which do not materially affect the use and occupancy of the parking facilities, and (ii) all required permits have been issued by relevant governmental agencies for use of the parking facilities for their intended purpose, excluding only punch list items which do not materially affect the use and occupancy of the parking facilities. Transfer of ownership to the CITY shall not relieve VILLAGE GREEN of the obligation to complete punch list items and finalize any required permits outstanding as a result of any punch list.

C. The CITY and/or the DDA will assume responsibility for management and maintenance of the parking facilities upon transfer of ownership of those facilities to the CITY, except as provided in Section 5(c) below. If the DDA management responsibility for the parking facilities is for any reason terminated, whether as a result of the termination or amendment of the Master Lease between the City and the DDA, the DDA is dissolved by action of the City or operation of law, or any other reason, the rights and obligations of the DDA under this Agreement shall transfer to and become the obligation of the City and VILLAGE GREEN'S rights and obligations under this Agreement will not be affected in any way by the transfer of the rights and obligations to the City.

4. Payment

All project construction costs shall be the obligation of VILLAGE GREEN, provided, however, that upon transfer of ownership of the parking facilities to the CITY, DDA will pay directly to VILLAGE GREEN $35,000.00 for each parking space entirely or in part constructed above grade excavated, and $45,000.00 for each parking space entirely constructed below grade. Below grade parking shall be defined as a parking space determined to be situated completely below the lowest point on the site as currently excavated, which point has been determined as 809 feet. For purposes of this Agreement, a parking space is defined as a three-dimensional area, which includes the floor, walls and ceiling of each parking space. The DDA financial commitment under this provision is inclusive of all project costs to construct the total number of parking spaces designed and built and is not limited to minimum number of spaces specified in Article 2A (i.e. DDA is committed to purchase all of the parking spaces built and delivered by Village Green).

5. Use of Parking Facilities

A. Upon substantial completion of the residential units of the Project (substantial completion being defined in Section 3(B)), the CITY will issue permits to VILLAGE GREEN for up to 73 parking spaces to be assigned standard (i.e., 24/7 access) monthly parking permits in the parking facilities (the specific number to be determined by VILLAGE GREEN and the location to be determined by the CITY and/or the DDA), for a period of twenty (20) years. VILLAGE GREEN shall have the option to renew this Agreement for four successive additional terms of five (5) years each, provided written notice of renewal is provided to the CITY not less than 6 months prior to the end of the term. Renewal of the Agreement by the City shall be subject to the following (i) VILLAGE GREEN is in full compliance with all terms of this Parking Agreement on the last day of the then current term, and has not demonstrated a pattern of repeated or cumulative breaches and defaults of the terms of this Parking Agreement during the expiring term. Repeated or cumulative breaches include but are not limited to three (3) or

more successive payments more than thirty (30) days late in any calendar year, (ii) CITY/DDA retain the unrestricted right to renegotiate the number of permits and/or payment terms for permits issued to VILLAGE GREEN during the renewal term; and (iii) VILLAGE GREEN is not in default of any obligation under the Condominium Agreement between VILLAGE GREEN and the CITY.

In addition, VILLAGE GREEN may request additional permits for the use of condominium residents be issued to VILLAGE GREEN for overnight/limited access monthly parking (i.e., flex parking) for up to 73 parking spaces to be used at another City-owned parking facility(s) with monthly permits located in downtown Ann Arbor. Overnight/limited access monthly parking permits may only be used from 3:30 p.m. to 9:00 a.m., and will not allow entry to the designated parking structure during restricted hours. Permit holders will be subject to Overnight/Limited Access Monthly Parking Permit Rules in effect at the time the permit is issued and will remain subject to Overnight/Limited Access Monthly Parking Permit Rules, as amended by from time to time, for whatever period the permit is in effect.

VILLAGE GREEN shall be solely responsible for distribution of permits among and between the occupants of the residential units of the Project. Permits issued under this Section shall only be made available for use by the occupants of the residential units of the Project.

B. VILLAGE GREEN shall pay to the DDA the following fees for each permit issued under this Agreement ("Permit Fee"): (i) an initial fee for the issuance of a card required to obtain access under the permit, which fee shall be at the then prevailing charge for such access cards, (ii) a monthly fee at the then prevailing charge as established by the DDA and the City for a standard monthly permit, and (iii) a monthly contract surcharge in addition to the standard monthly permit fee. . The contract surcharge shall initially be Thirty and no/100 dollars ($30.00) Twelve months from the issuance of the first permit under this Agreement, and continuing on an annual basis thereafter during the term of the Agreement effective the anniversary date of the issuance date of the first permit or such other date as established by the DDA and/or the City, the contract surcharge will be increased by the rate of inflation then prevailing. The monthly permit fee for an overnight/limited access monthly parking permit shall initially be Thirty and no/100 dollars ($30.00). The City and/or the DDA shall have the right, from time to time during the term of the Agreement, to revise the Permit Fees payable by VILLAGE GREEN under this Agreement to correspond to authorized changes to the then prevailing rates by a written notice delivered at least sixty (60) days prior to the effective date of such revision. For purposes of this Agreement, the prevailing rate for a parking space in a City-owned parking facility will be the rate generally charged to individuals on an arm's length basis for monthly parking permits. VILLAGE GREEN shall pay the DDA the total of the Permit Fees for each permit issued under this Agreement on a monthly basis, in a single lump sum, not later than the first day of the calendar month for which such permits are issued. The Permit Fees for each calendar month shall be payable for all permits issued by the DDA for that calendar month regardless of whether or not VILLAGE GREEN has distributed the permit to an occupant of a residential unit for use that month or whether permit holder has reimbursed VILLAGE GREEN for that permit fee. Failure to make timely payments consistent with this Section will be subject to the established late fee procedures by the DDA.

C. Prior to substantial completion of the residential units, VILLAGE GREEN may use up to73 spaces in the parking facility, at a location approved by the CITY and/or the DDA,

for the parking of construction-related vehicles and/or the storage of construction materials, provided, however, that VILLAGE GREEN shall be responsible for the maintenance of said spaces subject to ordinary wear and tear. VILLAGE GREEN shall pay to the DDA the following fees for each permit issued and/or space occupied, in whole or in part, under this Section: (i) an initial fee for the issuance of any card required to obtain access under the permit, which fee shall be at the then prevailing charge for such access cards, and (ii) a monthly permit fee for each calendar month during which the permit is issued to or space occupied, in whole or in part by VILLAGE GREEN. The monthly permit fee for temporary construction vehicle parking/construction materials storage shall be the same permit fee payable for a standard monthly parking permit. VILLAGE GREEN shall be solely responsible for payment of these fees regardless of whether it retains the permits for its use, assigns permits to its contractors for construction vehicle parking or uses the designated location and the spaces comprising that location for storage of construction materials.

D. VILLAGE GREEN may at any time during the term of this Agreement reduce the number of permits to which it is entitled on written notice to the DDA. Any such reduction shall be considered permanent unless otherwise agreed to in writing, and at its discretion, by the DDA and/or the City.

E. If during the term of this Agreement, renovations or repairs are required to the parking facilities, the DDA shall use its best efforts to minimize the effect of such repairs or renovations upon the utilization of the permits under this Agreement. If despite such best efforts, the utilization of some or all of those permits must be temporarily suspended, then the DDA shall use its best efforts to arrange for alternative parking arrangements for the affected permit holders at the nearest available City-owned parking facility with monthly permits. VILLAGE GREEN will remain liable to the DDA for all Permit Fees accrued under this Agreement except for spaces that are not available for use by VILLAGE GREEN as a result of ongoing repairs or restoration.

6. Default/Termination. The following will constitute events of default VILLAGE GREEN under this Agreement.

A. The failure by VILLAGE GREEN to pay any Permit Fees after the date for payment specified in Section 5(B), which shall be considered a "Monetary Breach" hereunder, and the failure to remedy that breach within fourteen (14) days after the date that the DDA delivers written notice to VILLAGE GREEN identifying such breach and demanding payment of the full amount owning; or

B. The breach by VILLAGE GREEN of any other commitment under this Agreement, which shall be considered a "Non-Monetary Breach" hereunder, and the failure to remedy that breach within thirty (30) days after the date that the DDA delivers written notice identifying such breach and demanding such remedial action. However, if the Non-Monetary Breach cannot reasonably be cured with such thirty (30) days, and if VILLAGE GREEN furnishes a written response to the City and the DDA within such thirty (30) days explaining the need for more time to cure the breach, and if such explanation is reasonably satisfactory to the City, then the City will grant VILLAGE GREEN such additional time to cure that Non-Monetary Breach as may be reasonably necessary under the circumstances, provided that VILLAGE GREEN must attempt to accomplish the cure of such breach in a reasonably diligent manner.

C. Upon the occurrence of an event of default, the DDA, by further written notice to VILLAGE GREEN, may terminate this Agreement effective thirty (30) days following the day of delivery of such notice. In such event, the obligation of the DDA to issue permits for the parking facilities will terminate as of the effective date of such termination, VILLAGE GREEN will remain liable to the DDA for all Permit Fees accrued under this Agreement through the effective date of termination and VILLAGE GREEN will remain liable to the DDA for any damages incurred by the DDA or the City as a result of such default, provided, however, than any claims by the DDA for lost revenues (as distinguished from other damages incurred by the DDA) due to VILLAGE GREEN'S failure to utilize and pay for permits issued and/or available pursuant to this Agreement will be limited to accrued but unpaid Permit Fees through the effective date of termination plus the total of all Permit Fees for a period of one hundred twenty (120) days after the date of termination for the number of permits in effect on the date of termination plus any interest accruing thereon in accordance with Section 5(B).

7. Assignment. Except for the transfer of this Agreement to an operating company in which Jonathan Holtzman shall be the managing member, directly or through an entity of entities controlled by him, VILLAGE GREEN may not assign its obligations under this Agreement without written approval of the CITY and the DDA.

8. Binding Effect. This Agreement is binding upon the successors and assigns of the parties.

9. Amendment. This Agreement may be amended only by written agreement of the parties.

10. Applicable Law. This Agreement shall be construed in accordance with the laws of Michigan.

11. Counterparts. This Agreement may be executed in counterparts, each of which will be deemed an original.

12. No Third-Party Beneficiaries. This Agreement is executed only for the benefit of the named parties, and no third-party beneficiaries are created by this Agreement.

13. Authorization. Any individual executing this Agreement in behalf of an entity warrants that he or she has authority to bind said entity to this Agreement.

14. Notice. Any notice required under this Agreement shall be provided by first-class mail or hand delivery as follows:

If to VILLAGE GREEN:
30833 Northwestern Highway
Suite 300
Farmington Hills, MI 48334

If to the CITY:
City of Ann Arbor
100 N. Fifth Avenue, POB 8647
Ann Arbor, Michigan 48107-8647
Attn: CFO
cc: City Attorney

If to the DDA:
Ann Arbor Downtown Development Authority
150 S. Fifth Avenue, Suite 301
Ann Arbor, MI 48104
Attn: Executive Director

15. Realignment of Parcel; Utility Easement. This Agreement is being executed approximately simultaneously with a certain Option Agreement (the "Option") between the City and Village Green relative to the land (the "Land") upon which the Project will be constructed. Pursuant to the Option, Village Green may not exercise its right to purchase such Land until such time as certain conditions, including the execution of this Parking Agreement, have been met. Under the terms of the Option Agreement, the City is obligated to use its best reasonable efforts to acquire certain additional property and facilitate the relocation of a transformer located within the abutting alley with Detroit Edison Co. (DTE). The parties acknowledge and agree that this Agreement is contingent on (i) the completion of the acquisition of the adjacent property and reconfiguration of the property to be conveyed to VILLAGE GREEN to include the additional acquired property, and (ii) the execution and delivery of any and all easement agreements necessary for the relocation of the electrical transformers. It is understood that DTE must petition, and the City Administration shall assist in facilitating the petition, to City Council for the granting of any and all such easement agreements.

The parties hereby execute this Agreement as of the date above.

VILLAGE GREEN RESIDENTIAL PROPERTIES, L.L.C.

By: _____
Jonathan Holtzman
Its: Manager

CITY OF ANN ARBOR

By: _____
John Hieftje, Mayor

By: _____
Jacqueline Beaudry, Clerk

Approved as to Substance:
_____
Roger W. Fraser, City Administrator

Approved as to Form:
_____
Stephen K. Postema, City Attorney

ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY

By: _____
Its: CHAIRMAN

Approved as to Substance:
_____
Susan Pollay, Executive Director

8

R-453-9-07

RESOLUTION TO APPROVE PARKING AGREEMENT WITH VILLAGE GREEN RESIDENTIAL PROPERTIES, L.L.C.

Whereas, Village Green Residential Properties, L.L.C. ("Village Green") was selected in response to RFP No. 621 to redevelop the City-owned property located at First and Washington Streets, Ann Arbor;

Whereas, City Council Resolution R-71-2-07 approved an Option Agreement for Purchase of Land with Village Green;

Whereas, Under the terms of the Option Agreement, Village Green may not be exercised by Village Green until all necessary approvals and supporting agreements have been negotiated, approved and executed, including a Parking Agreement between Village Green, the DDA and the City;

Whereas, The City Administration, the DDA, and Village Green have reached agreement on the rights, duties and responsibilities of each of the parties in connection with the construction of a parking structure and the operation and maintenance of the private and public parking spaces comprising the parking structure; and

Whereas, The DDA Board approved the Parking Agreement on September 5, 2007;

RESOLVED, That City Council approve the Parking Agreement between Village Green, the DDA, and the City for the construction of a parking structure and the operation and maintenance of private and public parking spaces comprising the parking structure as part of the Ann Arbor City Apartments development project; and

RESOLVED, That the Mayor and City Clerk are authorized and directed to execute the Parking Agreement after approval as to substance by the City Administrator and approval as to form by the City Attorney.

Submitted: Finance and Administrative Services
Date: September 24, 2007

Approved: City Attorney

APPROVED
BY ANN ARBOR CITY COUNCIL
September 24, 2007
CITY CLERK
ANN ARBOR, MI

MEMORANDUM

TO: Mayor and City Council

FROM: Tom Crawford, Chief Financial Officer

DATE: September 24, 2007

SUBJECT: Resolution to Approve Parking Agreement with Village Green Residential Properties, L.L.C.

Attached for your review and approval is the negotiated Parking Agreement with Village Green Residential Properties, L.L.C. in connection with the redevelopment of the City-owned property at First and Washington.

City Council previously approved an Option Agreement to purchase the City-owned property at First and Washington with Village Green Residential Properties, L.L.C. (R-71-2-07). Under the terms of the Option Agreement, the Option may not be exercised by Village Green until all necessary approvals and supporting agreements have been negotiated, approved and executed. A Parking Agreement with the City and the Ann Arbor Downtown Development Authority (DDA) is the first of the supporting agreements to be negotiated and submitted for approval by the DDA and the City.

The Parking Agreement identifying the rights, duties and responsibilities of each of the parties in connection with the construction of a parking structure and the operation and maintenance of the private and public parking spaces comprising the parking structure. The Parking Agreement addresses the goals for redevelopment of the site by replacing public parking spaces on the site and incorporating alternative transportation space (i.e., zip car parking, bicycle storage).

The DDA approved the Parking Agreement at its regular meeting on September 5, 2007.

Approval of the Parking Agreement is recommended.

Prepared by: Mary Joan Fales, Senior Assistant City Attorney
Reviewed by: Tom Crawford, CFO
Approved by: Roger W. Fraser, City Administrator

Attachment: DDA Resolution

RESOLUTION OF SUPPORT FOR A PARKING CONTRACT BETWEEN THE CITY OF ANN ARBOR AND VILLAGE GREEN

Whereas, The City of Ann Arbor owns a parcel of land at the corner of First and Washington Streets and it issued RFP #621 for the sale and redevelopment of this property;

Whereas, The primary goals of the RFP were to:

- Increase downtown residential density and diversity
- Replace public parking spaces on this site
- Maximize the financial return to the City for the sale of the land
- Maximize TIF revenue to the Ann Arbor Downtown Development Authority (DDA) for the redevelopment of this site;

Whereas, Three proposals were received and Village Green Companies was determined by the City to be the appropriate developer of the residential units on this site;

Whereas, City and DDA staff have worked with Village Green representatives to prepare a proposed parking agreement between the City, DDA, and Village Green on this site which includes the following elements:

- Village Green will construct no fewer than 205 parking spaces on this site. The number may actually range between 230 and 260 parking spaces, and optimally may even exceed that number.
- Village Green will also provide for bicycle parking as required under code plus alternative transportation (i.e. Zip Car) parking as part of this development.
- The building will be a condominium and a condominium agreement will be arranged between the two parties with details providing for common area maintenance and use.
- The DD will pay for all parking spaces and the City will own all parking spaces which will be one unit of this condominium. The DDA will pay $35,000 for each parking space determined to be entirely or in part located above the lowest area of the site as currently excavated, which is determined to be 809 feet. The DDA will pay $45,000 for each parking space determined to be entirely located below 809 feet. A parking structure parking space is defined to include the floor, walls and ceiling of each space.
- Village Green will contract with the City for 73 parking spaces out of the total using a standard contract formula that requires them to pay the standard monthly permit fee (currently $125/month) plus a monthly surcharge which is initially set at $30/month. This monthly surcharge will increase annually by the rate of inflation. Village Green will also pay a deposit for each permit card issued.
- Village Green may also request additional "overnight/off-peak" monthly permits for its residents at another City-owned facility.

Whereas, The DDA/City Partnerships Committee recommends approval of this parking agreement;

RESOLVED, The DDA approves the recommendations as set forward by the DDA/City Partnerships Committee, subject to review and comment by the DDA Attorney, and recommends approval of this agreement by the City.

A vote on the motion showed:
AYES: Boren, Collins, DeVarti, Greff , Gunn, Hall, Hieftje, Hewitt, Lowenstein, Smith, Splitt
NAYES: None
Absent: None
Abstentions: Mouat
The motion carried.
September 5, 2007

APPENDIX C: PARKING STRUCTURE DESIGN GUIDELINES

Table of Contents

Introduction

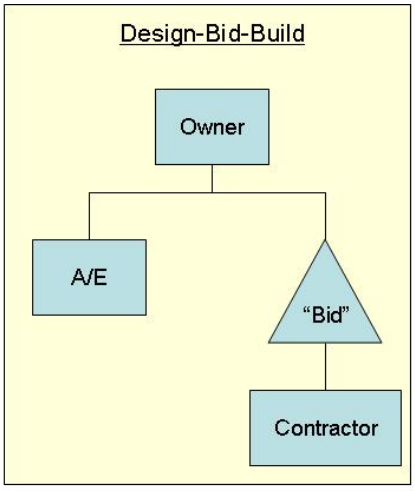
This document was developed for the City of Raleigh as a guide for future parking structure design in Downtown Raleigh. It contains information to help developers and designers incorporate parking structure components into proposed projects. The concepts presented will help produce functional, well-designed and patron friendly parking structures that will become valued infrastructure elements for the Downtown. The concepts are presented so that common design mistakes can be avoided by being addressed early in the design process. The document should be periodically updated to reflect state-of-the-art parking design practices and principles. To support this point, this document is an update to the original design guidelines document with the specific goal of incorporating recent advances in sustainable operations and management strategies. This addition nicely complements the recent Parking Strategic Plan recommendations that puts a greater emphasis on mobility management strategies. It includes the following categories:

- Introduction
- Project Delivery
- Sustainable Design and Accreditation
- Site Requirements
- Site Constraints
- Concept Design
- Circulation and Ramping
- One-Way vs. Two-Way Traffic
- Other Circulation Systems
- Access Design
- Parking Layout and Geometrics
- Parking Layout Efficiency
- Pedestrian Requirements
- Accessible Parking Requirements
- Safety and Security
- Lighting
- Signage and Wayfinding
- Drainage
- Open or Enclosed Parking Structures
- Structural Systems
- Durability Design
- Other Considerations
- Incorporating Other Land Uses
- Sustainable Operations and Management
- Sustainable Operations and Management Checklist

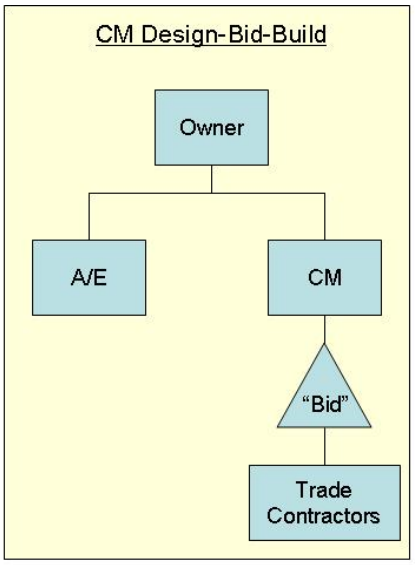
In any future parking development project, it is highly recommended that a qualified parking structure design specialty firm be engaged in the project due to the unique characteristics and special design expertise required to develop a successful project.

Project Delivery

There are four primary project delivery methods commonly used to design and construct parking structures. Two design professional's handbooks titled the *Design-Build Project Delivery* and the *Design/Contract-Build Project Delivery,* published by the American Council of Engineering Companies (ACEC), are helpful references. Each method is described on the following pages, along with a graphical depiction of the contractual relationships for each:



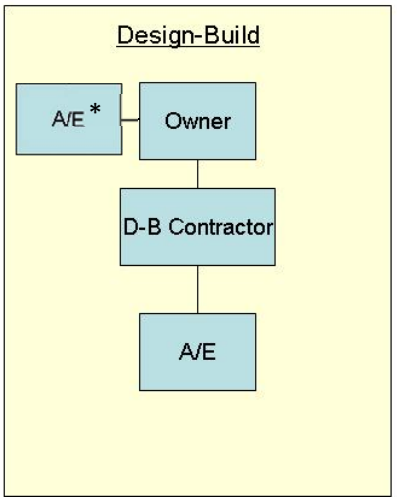
1. Design-Bid-Build (D-B-B) projects are those where the owner selects and contracts with the lead designer (Parking Consultant or Architect/Engineer). They in turn represent the owner in defining the project and preparing drawings and specifications to meet the owner's needs for competitive bidding to contractors. Often on public projects, the owner is required to select the lowest "responsive and responsible" bid, with the contractors' qualifications often not given consideration. The D-B-B method is sometimes referred to as the "traditional" process and is still the most common method.



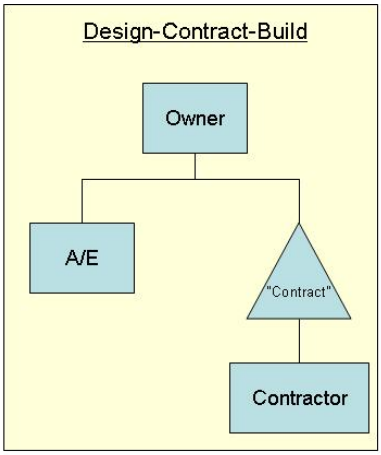
2. Construction Manager - Design-Bid-Build (CM D-B-B) is where the owner selects and contracts with the architect/engineer (A/E) who represents the owner in defining the project and preparing drawings and specifications to meet the owner's needs for bidding. However, the owner also retains a construction manager (CM) who works with the A/E during the design phases, sets the project schedule, and performs construction cost estimates. The CM bids the work to subcontractors for the various trades. This is a better method than D-B-B for projects where the owner wants fast track or phased construction.

3. Design-Build (D-B) are cases where the owner retains a D-B contractor who in turn retains the A/E so there is a single entity responsible for both design and construction. Often the owner prepares or retains another A/E to prepare design build criteria documents as described below. The owner can select the D-B team based on qualifications and cost, consistent with the bidding documents. There has been more interest in D-B type projects recently because of owners who perceive benefits regarding cost, schedule, and risk management.

4. Design-Contract-Build (D-C-B) are projects where the owner selects and contracts with the A/E. The A/E prepares preliminary documents that are the basis for the owner contracting with the contractor early in the design process, rather than waiting for final design documents to be prepared as for D-B-B. This method combines the advantages of the D-B-B and D-B methods while reducing many disadvantages to allow the owner to have the most qualified A/E and contractor involved in their project from the design phase through the completion of construction.



*: Optional but recommended; A/E prepares design build criteria documents that are basis for



In recent years, there has been an increasing interest and use of Design-Build in the construction of parking structures. Legislation has been enacted in many states to allow D-B to be used by public entities because prior laws required publicly funded construction contracts to be awarded based upon completed design documents.

Advantages of Design Build

- Owner has a single point of responsibility for design and construction.
- Potential for better design and construction coordination because the A/E is working for the contractor.
- Owner does not have to arbitrate disputes between the A/E and contractor.
- Owner reduces their risk because the D/B contractor is responsible for errors or omissions in the design documents.
- Could be less administrative burden on the owner.
- Potential for accelerated schedule because the contractor is onboard at the beginning and because of the overlapping of design and construction work.
- Potential for lower costs due to the contractor being in greater control of the project and due to the accelerated schedule.
- Costs are well defined earlier in the process

Disadvantages of Design Build

- The D-B contractor has the incentive to complete projects faster and less expensively which can mean reduced quality of materials and workmanship.
- The owner has less involvement and control of the design because the A/E represents the D-B contractor's best interests, not the owner's. Not only is this a disadvantage for the owner, but it creates a difficult conflict of interest for the A/E.
- The owner does not benefit from independent advice and input from the A/E and contractor.
- Greater definition of the project is required up front to define goals, objectives, and minimum requirements for project function, appearance, quality, materials, operation, etc. prior to bidding to D-B teams.
- More risk for D-B teams, which can negate the potential cost saving opportunities.

When owners decide that D-B is right for their project, they can have a better chance of achieving a successful project utilizing the following procedures.

Parking structure built for Baylor University using the Design-Build delivery method

Recommendations Regarding the Design-Build Delivery Method:

- The owner should retain an A/E at project initiation to prepare the D-B criteria documents. This allows the owner to have more input into the concept design and set standards and criteria for the project. Also, due to the uniqueness of parking structures, it is important to have the A/E led by a parking consultant or for a parking consultant to have a significant role on the design team.
- D-B criteria documents should clearly define the project scope, function, appearance, quality, materials, and operations. The level of completeness of these documents varies, but generally they are in the 10 to 30 percent range (between Schematic Design and Design Development level of completeness).
- The owner should use a very transparent selection process to hire the D-B contractor, using the D-B criteria documents as the basis of the Request for Qualifications/Proposals (RFQ/RFP).
- The selection process should consider the D-B teams' technical qualifications and experience in addition to cost. Typically, there is a weighting of selection criteria such as the experience and expertise of the firms and key personnel making up the team, experience of the team working together, technical merits of design, project appearance, quality and safety programs of the contractor, references, schedule, and cost. The selection criteria and weighting should be defined in the RFQ/RFP.
- The owner's A/E who prepared the D-B criteria documents should continue during the final design and construction to represent the owner's interest and help assure that the design and construction are completed in conformance with the D-B criteria documents.

As an alternative to using the D-B method, the D-C-B or CM methods can often result in a project that meets the owner's best interests because:

- The A/E contracts to the owner, thus representing their interests, not the contractor's, which should enhance quality
- Design decisions can more easily be made that are in the best long-term interest of the owner, considering factors that will provide the lowest life cycle maintenance or operational cost, rather than emphasizing those that just provide the lowest first cost or schedule advantage
- The CM or contractor is onboard early in the design process so the A/E and contractor collaborate during design, enhancing innovation and opportunities to consider the contractor's cost saving ideas
- Similar schedule and cost advantages compared to D-B
- Less risk for all parties as responsibilities can be allocated where they are appropriate

Successful parking structure projects have been completed using all four of the construction methods discussed above. Understanding the advantages and disadvantages of each and following a process to address them will help assure that the completed project is a success for the user, owner, community, designer and builder.

Sustainable Design and Accreditation

While it is possible for parking structures to achieve certification, typically only occupied buildings receive certification for their sustainable design through the U.S. Green Building Councils (USGBC) Leadership in Energy and Environmental Design (LEED) accreditation program. However, parking structures that are part of a mixed-use project can help attain LEED points for the entire building project. The fact that stand-alone parking structures are generally not eligible for LEED certification should not discourage including sustainable design elements in parking structures.

Note: The Green Parking Council was recently acquired by the Green Building Certification, Inc. (GBCI), the certification body for US Green Building Council's (USGBC) global LEED green building rating system, which will now administer the Green Garage Certification Program.

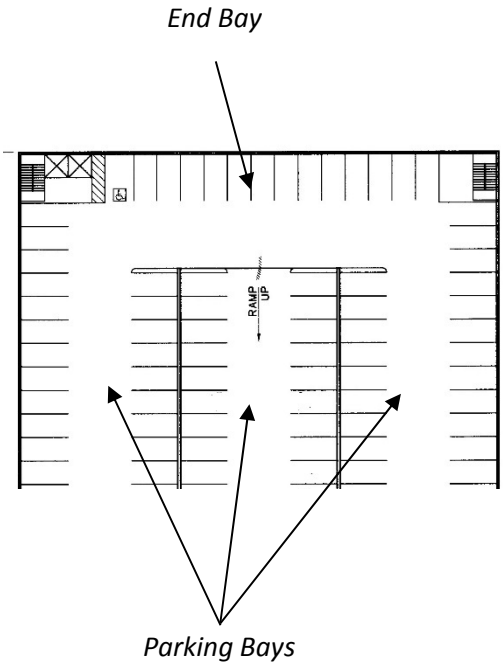
Examples of sustainable design features for parking structures include:

- Sustainable Site Development
  - Green roofs
  - Solar panel sunshades on the top levels
  - Alternative transportation accommodations
- Water Savings
  - Water-efficient landscaping
  - Irrigation using non-potable water
  - Innovative technologies for water retention/detention
- Energy Efficiency
  - Energy efficient light sources such as natural lighting, fluorescent, induction, and light emitting diodes (LED)
  - Photovoltaic solar panels
  - Computerized lighting controls and voltage reduction
- Materials and Resources Selection
  - Reuse of existing facades or shell
  - Use of recycled materials such as silica fume, fly ash, and steel
  - Carbon fiber reinforcement
  - Thin brick façade panels
  - Recycled rubber
- Indoor Environmental Quality
  - Low VOC products (e.g., paint, sealers and coatings)
  - CO monitoring and venting
  - Maximum natural ventilation and lighting (e.g., interior light wells)
  - Sustainable cleaning products
- Innovation and Design Process
  - Multimodal facilities
  - Automated parking facilities on smaller site footprints
  - Designs for 75-100-year life
  - Bicycle storage lockers

Site Requirements

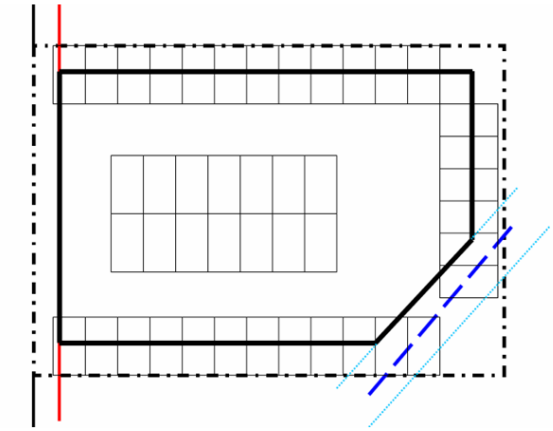
Large and rectangular shaped sites are ideal for parking structures. Although flat sites are generally more economical to develop, sloped sites can provide design opportunities such as access on different levels and/or no ramping between levels. For a reasonably efficient parking layout, double-loaded parking "bays" range in width from about 54 to 60 feet, depending upon the angle of parking and the width of the parking space. The overall width of the structure should be determined based upon multiples of the chosen parking bay width. An ideal length for a parking structure is at least 240 feet. Longer sites provide the opportunity to park along the end bays, which provides more parking spaces, improves efficiency, and lowers the cost per space. A longer site also allows for shallower ramps which provide improved user comfort.

Generally, parking bays should be oriented parallel to the longer dimension of the site and preferably in the predominate direction of pedestrian travel. Walking distance tolerances from parking to a primary destination are typically 200 to 300 feet for shoppers, 500 to 800 feet for downtown employees, and 1,500 to 2,000 feet for special event patrons and students.



Site Constraints

Other site issues to be considered when evaluating a potential site for a suitable parking facility include the following:



- Site Survey – a topographic survey of the site is a very important precursor to develop a conceptual plan. The site survey should delineate property lines, easements, and utility lines.

- Site Slope – The topographic information will define the slope of the site. Sometimes the slope of a site can be utilized to reduce internal ramping in a parking structure, resulting in significantly lower costs (however, this should be weighed against operational concerns created by the inability to circulate within the structure). A parking structure that is built into a hillside can also reduce the visual mass of the facility.

- Geotechnical & Soils – Obtaining a soils report with sample borings and a geotechnical analysis early in the design process is prudent. If soils with poor bearing capacity are present on the site, the added cost for structural foundations can be significant.

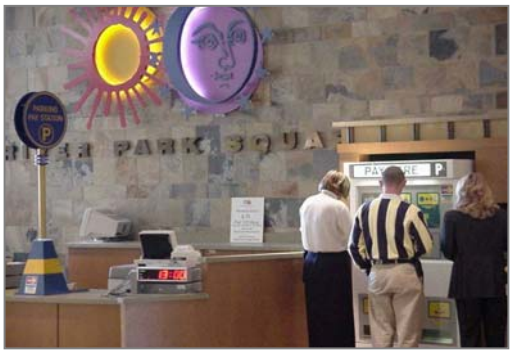
- Codes and Ordinances – Municipal ordinances often specify setbacks, building height and bulk limitations, floor area ratio to site area, etc. that can significantly affect the allowable area on a site for a parking structure. The local planning organization may also impose development guidelines that must be followed.

Concept Design

Much of the remainder of these guidelines addresses issues and elements of parking structures that should be considerations during the conceptual design phase.

Parking Structures for People

An overall design principal to keep in mind is that parking structures are for people. Designing to accommodate the users of a structure will help produce a better parking structure.



- Different user types will have different needs
- Some user types may need to be physically separated to ensure revenue control or for security reasons
- Different users require different pedestrian circulation systems
- Parking space widths and circulation geometry needs vary depending on the user type.
- Some vehicular circulation systems are better for specific user types:
    - Residential – Regular users enter and exit two times a day.
    - Education – May have peak loads in and out.
    - Hotel – Overnight guests, maybe event parking too.
    - Office – Low turnover. Regular users enter and exit two times a day.
    - Health Care Visitors – Wayfinding very important. Need to accommodate elderly drivers and passengers.
    - Health Care Staff – Shift time overlap and loading. Security issues, particularly at night.
    - Retail – High turnover. Occasional users - wayfinding to and from vehicle.
    - Elderly or Families with Small Children – Wayfinding again important. May need larger spaces and more elevators.
    - Events – Easy quick loading and unloading of structure. Multiple vehicular paths. Consider revenue collection methods, typically a flat fee on entry. Provide queuing space. Consider pedestrian flow to event - avoid crossing traffic.
    - Multiuse Garages – These guidelines focus on parking garage design for downtown Raleigh. Most of the garages in downtown will serve at least two user groups – short-term and long-term parkers – and may serve many other user groups. This is because future garages will be in activity centers that include office, entertainment, special event, restaurants, retail, lodging, and residential land uses – all of which have different parking characteristics. Attention should be given to creating entry, exit, and circulation designs that are flexible and adaptable to situations. Dual exit lanes that allow parkers with passes to exit quickly without having to wait in line with parkers who are paying should be considered to lower frustration levels for customers.

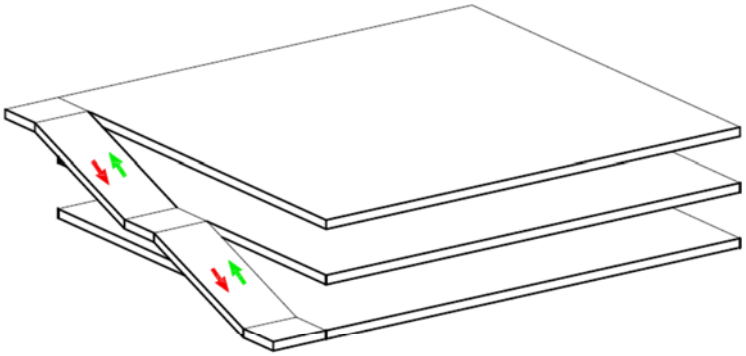
Circulation and Ramping

The basic circulation element for a parking structure is the continuous ramp with parking on both sides of the drive aisle. In continuous ramp structures, some of the parking floors are sloped for traffic to circulate from one level to another. Only on a sloping site that permits direct access to each level from the exterior roadways are ramps unnecessary; but they still may be desirable for internal circulation.

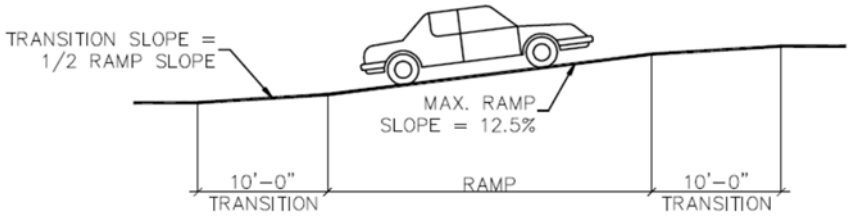
The basic criteria for choosing a circulation system are the simplicity or complexity of the system and the architectural compatibility. Ingress and egress capacities are also a consideration in the selection of a circulation system. Some circulation systems provide the opportunity for level façades which may be desirable.

A parking ramp slope of 5% or less is preferred, although parking ramp slopes up to 7% are tolerated by the public in very dense urban areas. Parking ramp slopes should not exceed a 6.67% slope, which is the maximum parking slope permitted in the International Building Code (IBC). The acceptable ramp slope must also conform to the current Raleigh City Building Code.

Non-parking ramps are often employed at airports, casinos, large retail structures, for special event structures, and on small and irregularly shaped sites. Non-parking ramps consist of circular helixes (most common), express ramps (external), and speed ramps (internal). Non-parking ramp slopes should have a maximum slope in the 12% to 14% range. Non-parking ramp slopes up to 20% are sometimes considered if covered or equipped with snow melt systems.



Parking structures with non-parking ramps tend to be less efficient in terms of square feet of structure per parking space which directly increases the construction cost per parking space.



A grade difference of 8% or more requires transition slopes so vehicles do not “bottom out”. Recommended are minimum 10’-0” transition slopes at the top and bottom of the ramp that are one-half of the differential slope. For instance, two 10’-0” transition ramps sloped at 6.25% would be required at the bottom and the top of a ramp sloped at 12.5%.

One-Way vs. Two-Way Traffic

One of the primary factors in the design of parking structure is determining the traffic flow: one-way or two-way. Typically, a parking bay for a one-way traffic flow is narrower than for a two-way flow. The available site dimensions will influence the parking bay width and thus also influence the circulation pattern. There are advantages and disadvantages to both circulation patterns. One-way traffic flow should never be combined with 90° parking. In parking facilities with one-way traffic flow, the angle of the parking stalls establishes the direction of vehicle traffic.

Advantages of One-Way Traffic Flow

- Easier for parkers to enter/exit parking spaces.
- Vehicles are more likely to be centered in angled spaces.
- Less circulation conflict and reduced potential for accidents.
- Better visibility when backing out of a stall.
- Separation of inbound and outbound traffic and improved flow capacity of the circulation system.
- The intended traffic flow is self-enforcing.
- One-way traffic allows the angle of parking to be changed to accommodate changes in vehicle sizes.

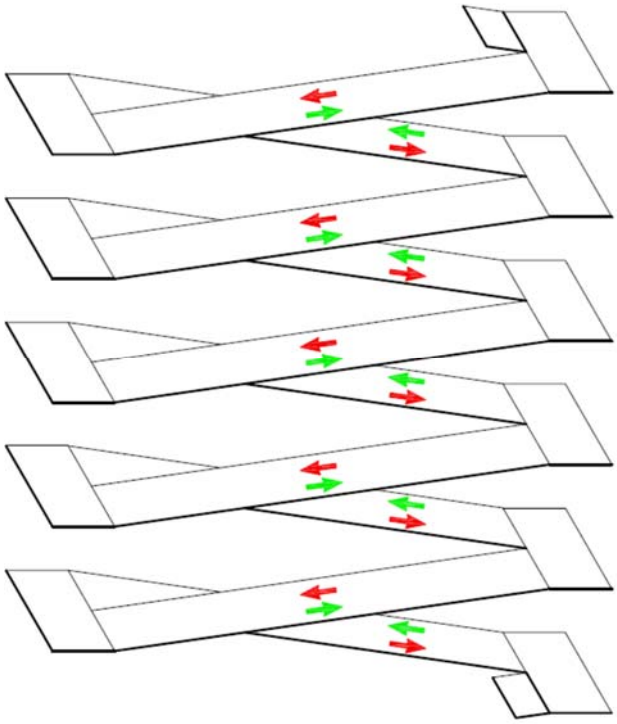
Advantages of Two-Way Traffic Flow

- Wider drive aisles allow parkers to pass other vehicles.
- Wider drive aisles are safer for pedestrians.
- Better angle of visibility when searching for a parking space.
- Traffic flow follows its own pattern rather than one that is forced.
- Two-way traffic and 90 parking makes more efficient use of parking aisles (more spaces in a run).
- Two-way parking facilities can essentially operate as one-way facilities when there is heavy directional traffic.

Single Threaded Design

To develop a reasonably efficient free-standing parking structure, the **minimum** dimensions needed are about 122 feet in width by 155 feet in length. A width of 122 feet allows for a two-bay facility with two-way traffic flow and 90-degree parking. A facility with two-way traffic and a five-foot rise along each bay requires approximately 155 feet in length for a minimum floor-to-floor height of about ten feet. That is, one 360-degree turn within the facility equates to a vertical rise of ten feet. A structure in this configuration has sloping floors along both façade sides. However, sloping floors can make façade treatments challenging. On larger sites that allow a structure length of about 255 feet, one bay can be sloped rising 10 feet with opposite façade having a "level" floor.

Because of the number of 360º turns needed to ascend in a single threaded structure, the number of levels (floors) should preferably be limited to a maximum of six, otherwise the number of turns required and the number of spaces passed becomes inconvenient. A structure with a two-bay single thread design has a capacity for a maximum of approximately 750 spaces. The isometric diagram to the right represents a two-bay single-threaded helix.



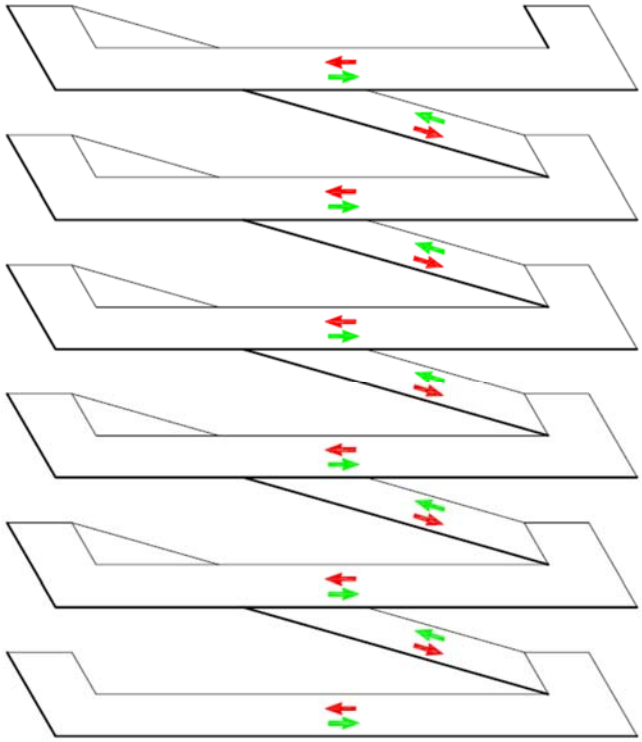
Single Threaded Helix with Sloping Floors

Principal Advantages of a Single-Threaded Helix

- Repetitive and easy to understand for users.
- Potentially more flat-floor parking and level façade elements.
- Better visibility across the structure, which enhances security.

Principal Disadvantages of a Single-Threaded Helix

- More revolutions required going from bottom to top and top to bottom.
- Two-way traffic bays have less flow capacity than one-way traffic bays. Traffic in both directions is impeded by vehicles parking and vacating a space.

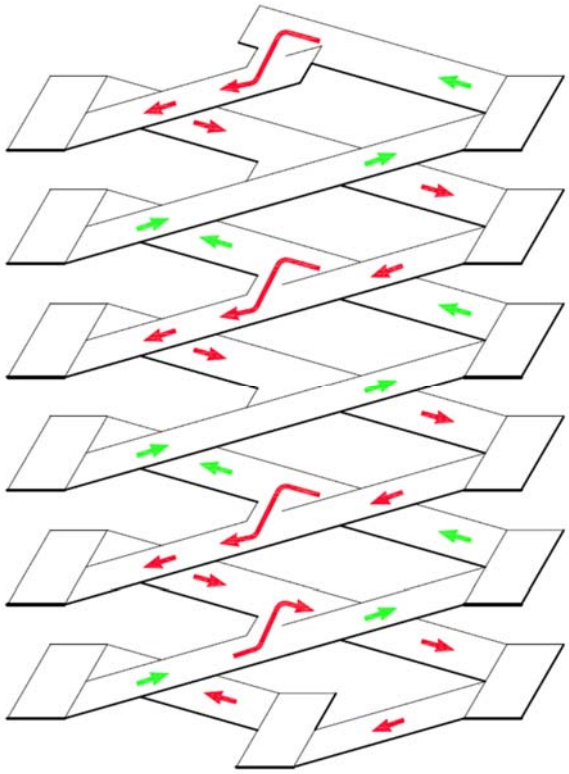


Single Threaded Helix with One Level Bay

Double Threaded Design

A facility with a one-way circulation system and angled parking can be provided in a double-threaded helix with modules ranging from 54 to 58 feet in width, depending upon the angle of parking. The preferred angles of parking for an efficient layout are 60°, 70° and 75°. A double thread, which requires a ten-foot rise along each module, requires 240 feet in length. More efficient layouts can be achieved on longer sites. The isometric to the right represents a two-bay double-threaded helix with one-way traffic.

A double-threaded helix can work with either one-way or two-way traffic flow, although one-way traffic is more common. A two-way double threaded design can be configured as two separate structures with no vehicular connection. A double-threaded helix rises two levels with every 360 degrees of revolution, which allows for two intertwined “threads” and the opportunity to circulate to an available parking space without passing all parking spaces as inbound and outbound traffic can be separated. Because of this, double-threaded helixes are often recommended for larger facilities with seven or more levels. A two-bay double thread has a functional system capacity for up to approximately 2,000 spaces with angled parking and one-way traffic flow.



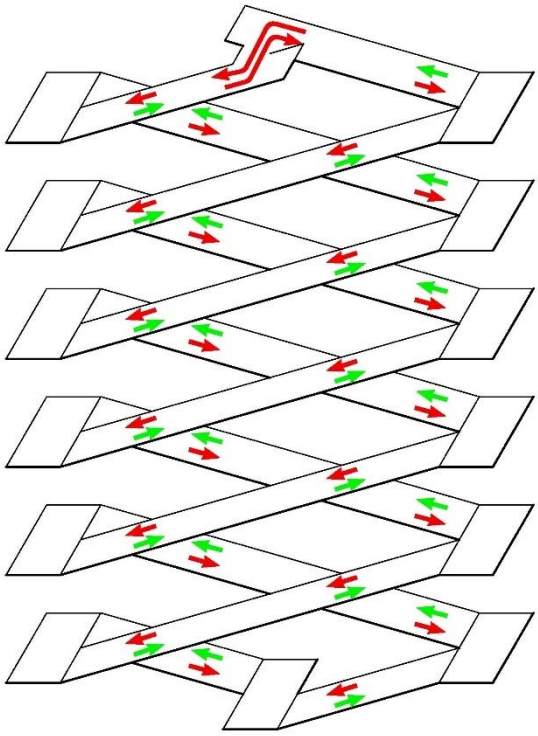
One Way Double Threaded Design

Principal Advantages of a Double-Threaded Helix

- Efficient circulation and more traffic flow capacity
- Pass fewer spaces both inbound and outbound.

Principal Disadvantages of a Double-Threaded Helix

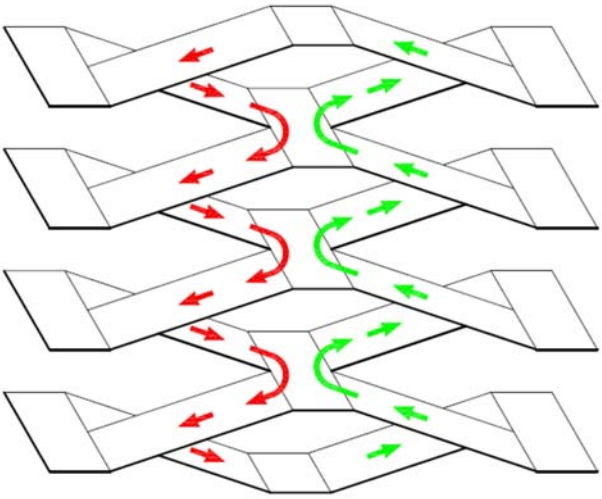
- Can be complex and confusing, particularly in finding one's vehicle upon return to the parking facility.
- Two-sloped bays and minimal flat-floor parking.

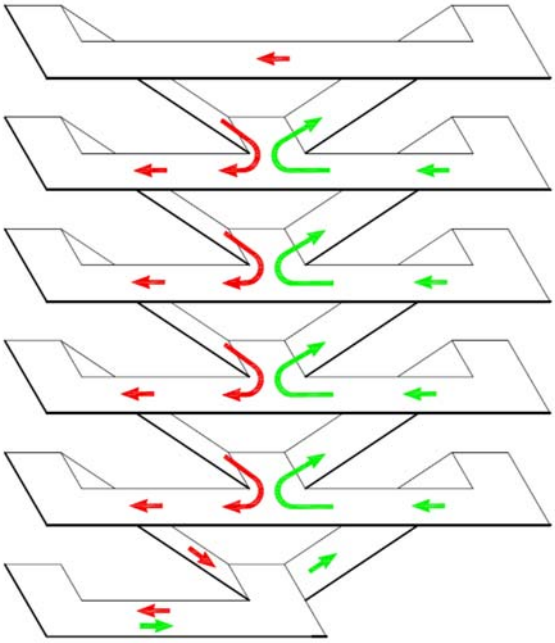


Two Way Double Threaded Design

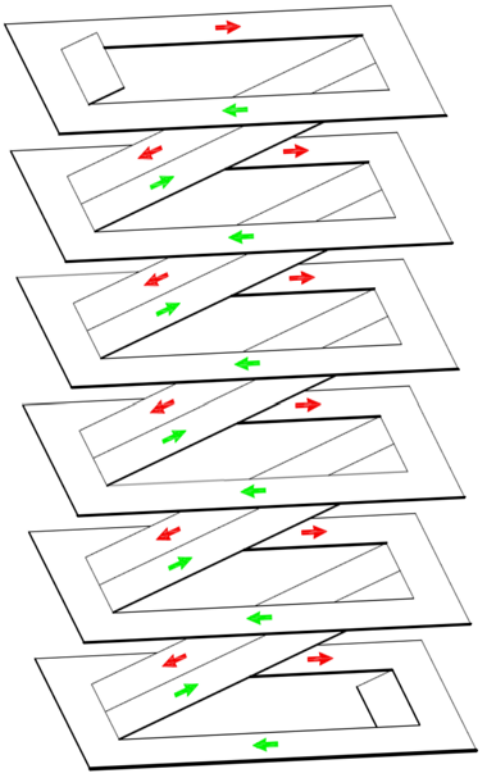
Other Circulation Systems

There are other parking and circulation systems that are often used in parking structures. Examples are provided below.

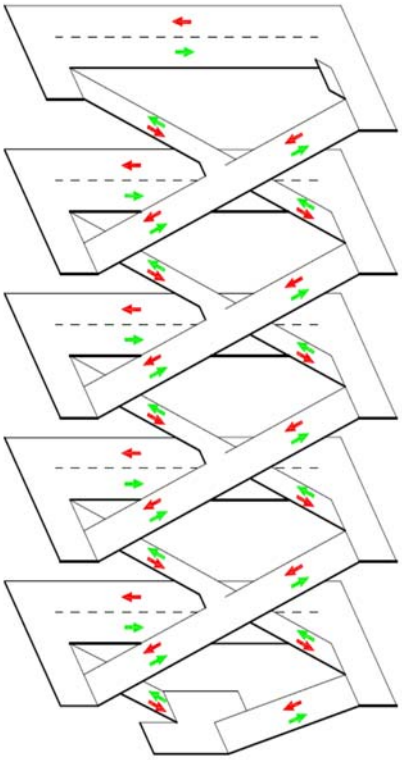




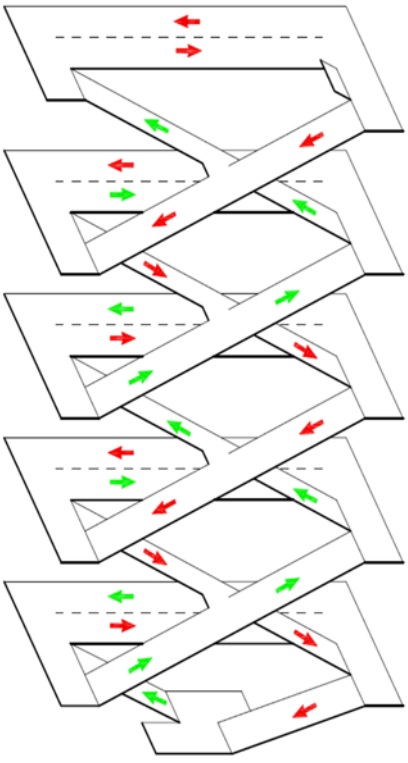
End-to-End Helix One Bay Sloped



Side-by-Side Helix



Two-way Double Threaded w/ Flat Bays



One-way Double Threaded w/ Flat Bays

Access Design

Vehicle entrances should be visible and easily identifiable. The minimum distance of entry/exits from corner intersections is at least 75 to 100 feet (preferably 150 feet.) Entrances and exits should have clear lines of sight. It is preferable to enter a facility from a one-way street or by turning right from a two-way street and to exit a facility by turning right on a low-volume street. High traffic volumes and left turns can slow exiting and cause internal traffic backups. Consideration should be given to acceleration/deceleration lanes on busy streets. Gates should be located far enough away from the street to allow at least one vehicle behind the vehicle in the service position (at a ticket dispenser, card reader or cashier booth) without blocking the sidewalk. Entry/exit areas that have parking control equipment should have a maximum 3% slope.

It is very important to provide the appropriate number of entry/exit lanes to meet projected peak traffic volumes. The number of lanes is a function of user groups served, peak-hour traffic volumes, and service rates of the parking control equipment. It is recommended to have a parking professional prepare a lane and queuing analysis to guarantee sufficient entry and exit capacities.

Cross-traffic at entry/exits should be minimized and preferably eliminated. When placing vehicle entries and exits together on one-way streets it is preferable to avoid English traffic conditions where traffic keeps to the left instead of to the right. Pedestrian/vehicular conflicts should be minimized by providing a pedestrian walkway adjacent to entry/exit lanes. Stair/elevator towers should be located so pedestrians do not have to cross drive aisles on their way to primary destinations.

Important Issues for Vehicle Entry and Exit Lanes

- The approach and the departure area from the lanes will also affect the rate of flow into or out of the structure. Tight turns equal a slower throughput.
- Pedestrian safety at entry and exit portals is paramount. Consider the vision cone of drivers entering or exiting the facility. Utilize transitional lighting at entry/exits.
- Check and recheck vehicle turning radii at all entry / exit lanes and adjacent ramps.
- Vehicle queuing analyses should be performed to ensure traffic does not back-up onto the exiting street system or the inside of the facility during peak periods of traffic flow.

Parking Geometrics

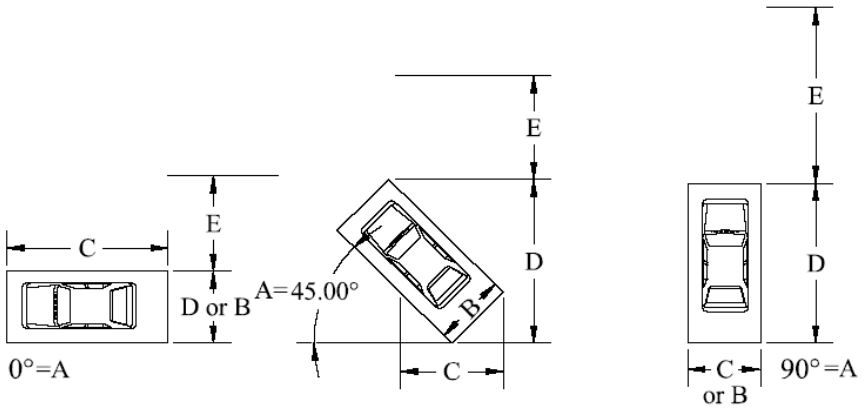
Parking geometrics refers to parking stall and drive aisle dimensions. Parking dimensions have been developed to comfortably accommodate the composite design vehicle, which refers to the dimensions of the 85th percentile vehicle in the range of vehicles from smallest (zero percentile) to largest (100th percentile). The composite design vehicle is the size of a Ford F150 truck (6'-7" x 17'-3").

The table below list City of Raleigh parking geometrics by parking angle for standard and compact spaces.

Parking Angle A	Stall Width B	Curb Length Per Car C	Stall Depth D	Driveway Width E
O°	9'- 0"	23'- 0"	9'- 0"	12'- 0"
20°	9'- 0"	26'- 4"	15'- 3"	11'- 0"
30°	9'- 0"	18'- 0"	17'- 8"	11'- 0"
40°	9'- 0"	14'- 0"	19'- 6"	12'- 0"
45°	9'- 0"	12'- 9"	20'- 5"	13'- 0"
50°	9'- 0"	11'- 9"	21'- 0"	14'- 0"
60°	9'- 0"	10'- 5"	21'- 10"	16'- 0"
70°	9'- 0"	9'- 8"	21'- 10"	18'- 0"
80°	9'- 0"	9'- 2"	21'- 4"	20'- 0"
90°	9'- 0"	9'- 0"	20'- 0"	22'- 0"

MINIMUM STANDARDS FOR COMPACT VEHICLES

Parking Angle A	Stall Width B	Curb Length Per Car C	Stall Depth D	Driveway Width E
45°	7'- 6"	10'- 6"	16'- 0"	11'- 0"
60°	7'- 6"	8'- 9"	16'- 9"	14'- 0"
75°	7'- 6"	7'- 10"	16'- 4"	17'- 5"
90°	7'- 6"	7'- 6"	15'- 0"	20'- 0"



The City's parking dimensions for standard spaces exceed industry standards. The table on the following page lists parking geometrics by User Comfort Factor (UCF) which correlates with a Level of Service (LOS) approach. Traffic engineers developed the LOS approach to classify traffic conditions on roadways from A (free flow) to F (gridlock). The UCF/LOS approach has been adopted by many parking consultants to help classify conditions in parking facilities. The recommended UCF categories for parking geometrics are as follows:

- UCF 4 = LOS A = Excellent
- UCF 3 = LOS B = Good
- UCF 2 = LOS C = Acceptable

LOS criteria should be related to the needs and concerns of users. Generally, users with low familiarity and high turnover should be accorded a higher UCF. If the city's parking standards are not used, we recommend minimum UCF 3 geometrics for moderate to high turnover parking (visitor, retail, etc.) and minimum UCF 2 geometrics for low turnover parking (employee, commuter, resident, etc.).

We recommend using one-size-fits-all parking spaces rather than segregating standard and small car spaces. However, if they are used, small car spaces should not exceed 15% to 20% of the total capacity of a facility.

Although parking garages can be custom designed to fit most sites of adequate size, in general, the minimum footprint dimensions for an efficient parking garage (in terms of square feet per stall) is approximately 125' x 300'. A base parking stall dimension, for most uses should be approximately 9.0' x 18.0'.

Parking Layout Dimensions

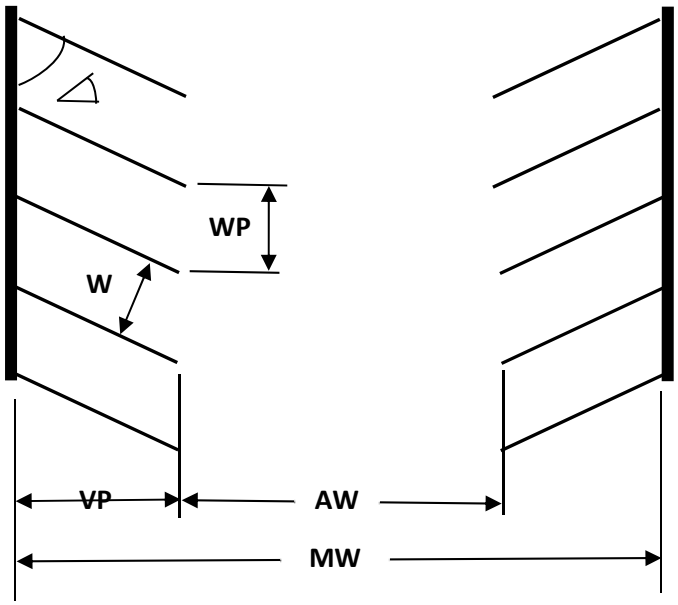
The following tables summarize parking layout dimensions by User Comfort Factor categories.

PARKING LAYOUT DIMENSIONS

Parking Angle	Stall Width Projection (WP)	Module Width (1) (MW)	Vehicle Projection (VP)	Aisle Width (AW)
User Comfort Factor 4				
	w = 9'-0"			
45	12'-9"	49'-10"	17'-7"	14'-8"
50	11'-9"	51'-7"	18'-2"	15'-3"
55	11'-0"	53'-0"	18'-8"	15'-8"
60	10'-5"	54'-6"	19'-0"	16'-6"
65	9'-11"	55'-9"	19'-2"	17'-5"
70	9'-7"	57'-0"	19'-3"	18'-6"
75	9'-4"	58'-0"	19'-1"	19'-10"
90	9'-0"	62'-0"	18'-0"	26'-0"
User Comfort Factor 3				
	w = 8'-9"			
45	12'-4"	48'-10"	17'-7"	13'-8"
50	11'-5"	50'-7"	18'-2"	14'-3"
55	10'-8"	52'-0"	18'-8"	14'-8"
60	10'-1"	53'-6"	19'-0"	15'-6"
65	9'-8"	54'-9"	19'-2"	16'-5"
70	9'-4"	56'-0"	19'-3"	17'-6"
75	9'-1"	57'-0"	19'-1"	18'-10"
90	8'-9"	61'-0"	18'-0"	25'-0"

Parking Angle	Stall Width Projection (WP)	Module Width (1) (MW)	Vehicle Projection (VP)	Aisle Width (AW)
User Comfort Factor 2				
	w = 8'-6"			
45	12'-0"	47'-10"	17'-7"	12'-8"
50	11'-1"	49'-7"	18'-2"	13'-3"
55	10'-5"	51'-0"	18'-8"	13'-8"
60	9'-10"	52'-6"	19'-0"	14'-6"
65	9'-5"	53'-9"	19'-2"	15'-5"
70	9'-1"	55'-0"	19'-3"	16'-6"
75	8'-10"	56'-0"	19'-1"	17'-10"
90	8'-6"	60'-0"	18'-0"	24'-0"

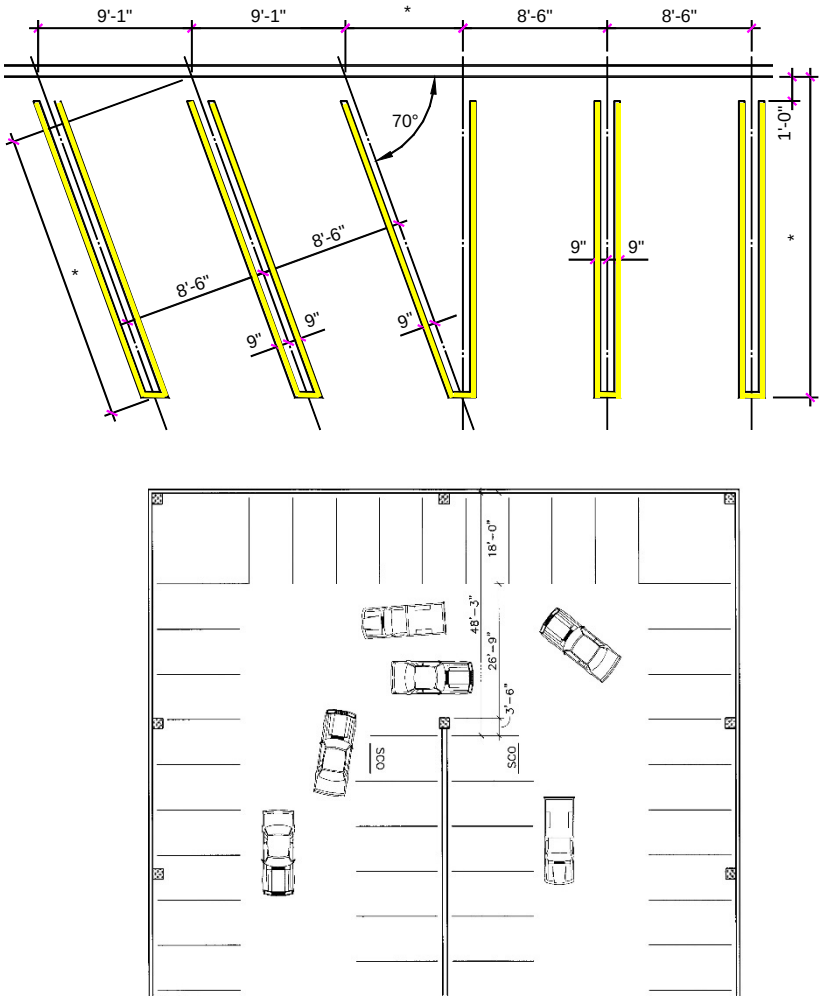
Note: (1) Wall to wall, double loaded aisle.



Parking spaces adjacent to walls, columns, elevators, stairs, etc. should be widened, if possible, by one foot so that vehicle doors can be more easily opened.

End bay drive aisles with two-way traffic should be a minimum of 26’ wide for improved turning maneuverability. Wider end bay drive aisles are recommended for high turnover parking facilities. If possible, it is also suggested for more comfortable turns to hold back the first stall on either side of the turning bay. Small-Car-Only (SCO) spaces are also recommended at the ends of interior parking rows. It is very difficult to make a turn around only one row of parking. Refer to the following graphic.

Double stripes for space striping are recommended as they help parkers center their vehicles between stripes, maximizing the space between vehicles (refer to the graphic below). Also recommended is the use of traffic yellow paint for stall striping as yellow paint is more visible over time than white paint.



Parking Layout Efficiency

Parking efficiency is expressed in square feet of construction per parking space. Parking efficiency directly correlates with the construction cost per space. Build less structure per space and the cost per space drops. Non-parking speed ramps for example increase the square feet per space.

Parking efficiency should be calculated considering the total parking structure size including the stairs and elevators and non-parking ramps. Any retail space that is incorporated within the structure is also usually included in the calculation.

Typical ranges of parking structure efficiencies are:

- Short Span Structural System = 330 to 390 Square Feet per Space
- Long Span Structural System = 300 to 340 Square Feet per Space
- Mixed Use Developments with retail, residential and parking can be as high as 400+ square feet per space

PARKING EFFICIENCY MAKES A BIG DIFFERENCE – EXAMPLE

- 360 sf / space X 500 spaces X $45 / sf = $8,100,000
- 330 sf / space X 500 spaces X $45 / sf = $7,425,000

A difference of $675,000 or $1,350 per space!

Pedestrian Requirements

Pedestrian traffic is equally as important in a parking structure as vehicle traffic. A safe, secure and well signed pedestrian path must be provided. Pedestrian access at the grade level should be separated from vehicular ingress and egress. Pedestrian access is usually adjacent to stair/elevator towers. It is also desirable to place a dedicated pedestrian aisle adjacent to a vehicle entry/exit because pedestrians are naturally attracted to these openings. Maximum lines of sight for both pedestrians and vehicles should be provided, and mirrors and warning devices should be incorporated when necessary. Access locations should be restricted to a few locations for security reasons.

A minimum of two stairs are required to meet code-required means of egress for fire exits in parking structures. Stairs shall be open or glass enclosed and be visible to the street for security reasons. The minimum stair width in parking structures is 44" and wider stairs are required for special events. Travel distance between exit stairs is specified in the IBC and is a maximum 300 feet without a sprinkler system and 400 feet with a sprinkler system. Stairs are usually placed in dead corners.

Elevators should be located at the facility terminus in the direction of pedestrian travel. Hydraulic elevators can be used for up to 5 levels or 50' to 60'. Traction elevators should be used beyond 5 levels. The minimum capacity and size is 3,500 lbs. and 5'-0" x 7'-0". The number of elevators is based on the number of spaces, the number of levels, user group(s) served, peak-hour flow rates, and the size and capacity of the elevator. A parking consultant can provide a preliminary indication of the number of elevators based on a formula that considers the information presented above. **We highly recommend that elevators have glass backs for security reasons.** Enclosed lobbies are recommended for protection from the elements on the top level.

Accessible Parking Requirements (ADA)

The table at right presents the required number of accessible parking spaces based on the total number of spaces provided in any given facility.

Required Accessible Spaces	
Total Spaces in Facility	**Minimum Accessible Spaces**
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	2% of total
1,001 and over	20 plus 1 for each 100 over 1,000

The accessible parking requirement for an institution like a hospital campus is not based on the total parking capacity but rather on the capacities of the individual facilities within a parking system, which always results in the provision of more accessible spaces overall. Accessible spaces for the institution do not have to be provided in each parking area, but can be supplied at a different location provided at least equivalent accessibility in terms of distance, cost, and convenience is provided.

All accessible spaces are 8’ wide with either a 5’ or 8’ access aisle. An accessible space and access aisle cannot be placed at a location with a running or cross slope greater than 1:50 (2%).

The current 1 to 8 ratio for the provision of van accessible spaces is changing to 1 to 6, and it is required to round up to the nearest whole number when determining the number of van spaces. The barrier free section of the International Building Code (IBC) has the same requirement. It is recommended to use the new 1 to 6 ratio when determining the number of van spaces. Van accessible spaces require minimum 8’-2” vertical clearance and have 8’-0” wide access aisles.

Each accessible space must have a sign showing the international symbol of accessibility mounted at least five feet above the pavement. All van accessible spaces must have an additional “Van Accessible” sign mounted below the symbol of accessibility (mount minimum of 5’ above pavement with other sign above). ADA requires rounding up to the next whole number when calculating the required number of spaces based on a percentage or ratio. For example, a parking facility with 810 spaces will have 17 accessible spaces (810 x .02 = 16.2 = 17 spaces), and 3 spaces must be van accessible (17 ÷ 6 = 2.833 = 3).

Accessible stalls cannot share access aisles when the parking is angled. Access aisles for van spaces must be on the passenger side when the parking is angled because vehicles cannot back into these spaces.

All accessible spaces must have an accessible route to public streets or sidewalks, accessible elevators, or accessible building entrances. An accessible route must have a minimum unobstructed width of 3’. A vehicle way (drive aisle) may be part of an accessible route, although it is preferred to place the accessible route at the front of the stalls. An accessible route can only pass behind other accessible spaces. It is permitted to cross a vehicle way with an accessible route. Automatic or push button door opening devices will be needed if the accessible path includes doors that patrons will need to enter/exit.

The running slope along an accessible route cannot exceed 1:20 (5%) and the cross slope cannot exceed 1:50 (2%).

It is recommended to cross hatch all access aisles and accessible routes.

Ultimately, accessible parking must be provided as required by existing city building and zoning codes. However, it is recommended that the standard ADA requirements detailed in this section be used if they exceed existing city requirements.

Safety and Security

Because curbs can be a potential tripping hazard, curbs in all pedestrian areas (at the end of parking rows, around stairs and elevators, dead corners, etc.) are strongly discouraged. The faces and edge of curbs that remain should be painted traffic yellow to enhance visibility.

Glass-backed elevators and glass enclosed and/or open stairways, visible to the adjacent street, are highly recommended for enhanced security. Security fencing should be installed below stairwells to eliminate the possibility of a person hiding under the stairs.

Lighting that enables users to see and be seen is one of the most important security features of a parking structure. A separate discussion on lighting is included in these guidelines.

Other important aspects of security design:

- Short span construction is not recommended. In short span construction, the columns are placed more closely together; thereby adding additional obstructions to lines of sight.
- Security fencing at the ground level should not be climbable. Security fencing ensures pedestrians enter/exit the facility only at designated pedestrian points.
- Landscaping should not provide hiding places.
- Security cameras are a deterrent to criminal activity.
- Panic alarms and two-way communication systems are recommended in prominent locations on each level.

In general, assure that as much openness as possible is provided in the design to improve sight lines, eliminate hiding places, and enhance perceived security.

Lighting

The following are key lighting considerations in parking facility design:

- Lighting is a key security measure
- Good lighting enhances user comfort and perception of safety
- Good lighting is a business attraction amenity
- Good lighting permits safe movement for pedestrians and vehicles
- Enhances signage visibility and readability
- Typically, light levels are not code regulated
    - Except emergency lighting @ 1 foot-candles minimum
- Industry Standards
    - Illuminating Engineering Society of North America (IESNA)
    - IESNA publishes minimum lighting standards by building type
    - Liability risk for non-compliance

The recommended lighting standards listed in the table to the right, slightly exceed the Illuminating Engineering Society of North America (IES) lighting standards for parking facilities. Staining the ceilings and walls white to enhance light levels is suggested.

IES also recommends higher light levels at facility entry/exit points (transitional lighting.)

Recommended Parking Structure Lighting Standards

Areas	Minimum Horizontal Illuminance on Floor Footcandles	Minimum Vertical Illuminance at 5 feet Footcandles	Maximum to Minimum Uniformity Ratio
General Parking & Pedestrian	2	1	10:1
Ramps and Corners			
Days	2	1	10:1
Nights	1	0.5	10:1
Entrance Areas			
Days	50	25	10:1
Nights	1	0.5	10:1
Stairways	7 avg.		10:1

Lighting Entry and Exit Lanes

- Provide additional lighting (50 fc) for 10'- 60' zone from building edge (Transitional lighting)
- Include daylight infiltration (> 15 fc)
- Typically 10' X 10' spacing of 150 watt fixtures
- Turn 2/3 of fixtures off at night

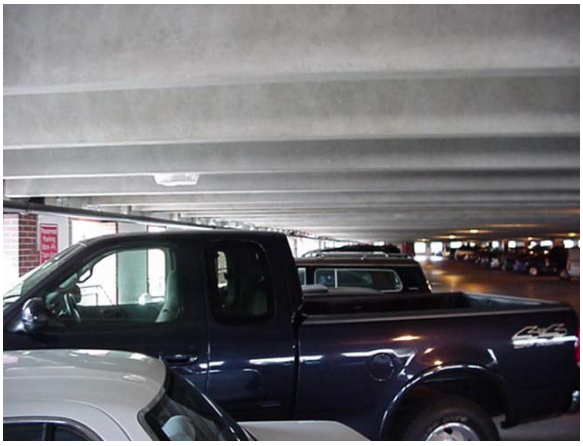
Light Source Types

- High Pressure Sodium
  - Golden White HPS Light Color
  - Common Parking Structure Lighting
  - Lamp Life = 24,000-28,500 Hours

- Metal Halide
  - White Light Color
  - Perceived Greater Brightness
  - Lamp Life = 15,000 Hours
  - Operating Cost Slightly > HPS

- Light Emitting Diode (LED)
  - Emerging Technology
  - Energy Efficient
  - Long Life

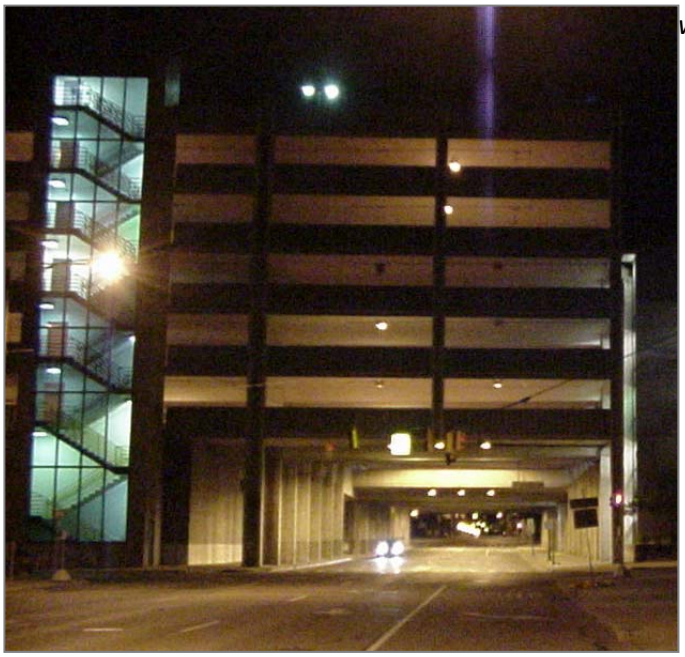
- Fluorescent
  - White Light Color
  - New Technology – Use in Cold Climates
  - Cold Weather Ballast (If Temps < 50º F)
  - Phosphor Coating
  - Sealed Fixtures
  - Lamp Life = 30,000 Hours
  - Energy Cost Effective



- Induction Lighting
  - White Light – Best color rendition
  - Instant Ignition Long Life Bulbs = 100,000 Hours
  - Energy Efficient
  - High Initial Costs

Lighting Expense Reduction Strategies

We recommend that the exterior bay lighting of open parking structures as well as roof top lighting be on separate circuits so that these lights can be turned off during the day to reduce energy consumption/costs as depicted in the lower picture on the right.



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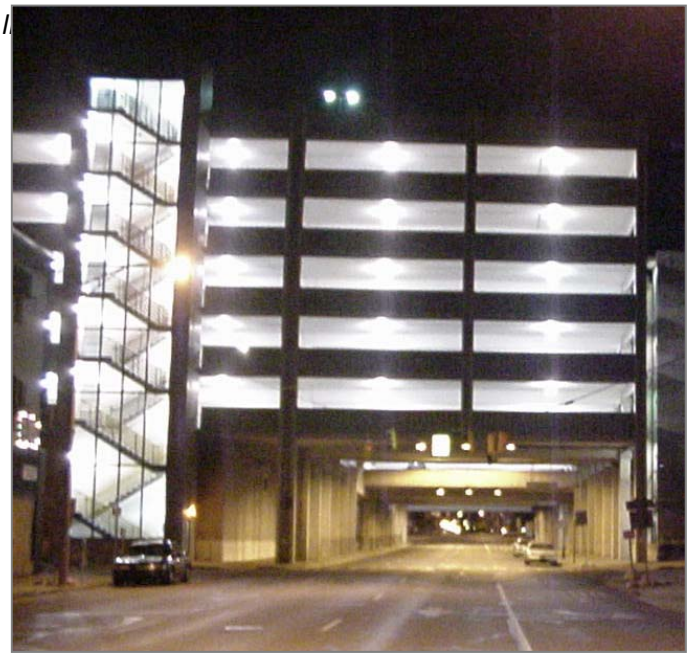


Signage and Wayfinding

Parking facilities can be very large, complex, and confusing. A well-designed graphics and signage system will effectively communicate necessary information to patrons, reduce confusion, improve safety, and enhance the overall user experience.

Sign messages should be simple and succinct. Messages on signs that are to be read quickly, such as vehicular signs, should be no more than 30 characters and six words in length. The typeface used should be simple and easy to read, and there is a general preference for Helvetica medium in the parking industry. Signs with lower case letters and initial caps are most easily read. The simple block arrow is recommended for parking signs. If a left turn is required, the arrow should be placed on the left side of the sign. The opposite is true for a right turn.

In parking structures, signs with a dark background and white letters are more easily read than signs with a white background and dark letters. The opposite is true in surface lots, where signs with white background and dark letters are better.

Vehicle Signs

Examples of vehicular signs include park and exit directional signs. Vehicular signs are ten or twelve inches in height with six or seven inch letters. Ten-inch signs are recommended for precast structures where sign visibility can be a problem. Vehicular signs should be centered over the drive lane or centered over the drive aisle when signs are mounted back-to-back.

Pedestrian Signs

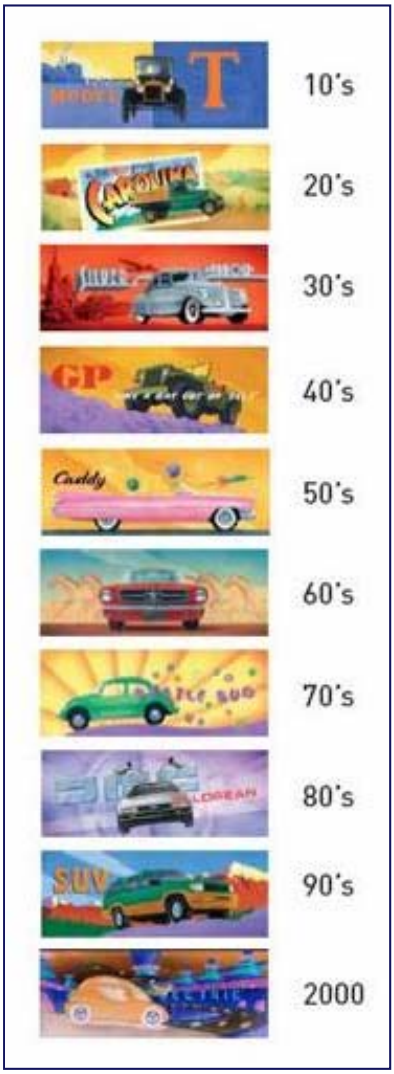
Examples of pedestrian signs include level number, remember level number, row number, and stair and elevator identification and directional signs. Pedestrian signs can be all one color or be color-coded by level. Pedestrian signs should be clearly distinguishable from vehicle signs so as not to interfere with vehicular traffic. Pedestrian signs in parking bays are most effective if located perpendicular to traffic flow, and they should be placed at the rear of parking stalls. Color-coding is often used to help patrons find their vehicles. It is not necessary to provide color-coding in parking facilities that are three levels or less. When color coding, it is recommended to use primary and secondary colors including red, blue, yellow, orange, purple, and green. If there are more than six levels that need to be color-coded, it is recommended to use white, brown, and black. Confusing colors such as turquoise (blue or green?) and taupe (brown, tan, or gray?) should be avoided.

The elevator core area provides an excellent location to utilize super graphics. Super graphics is defined as a graphic that covers a large area and is generally painted on a vertical surface, such as painted walls or elevator doors, with level designation incorporated.

Once colors have been determined, the color coding must appear on each parking floor (e.g., on columns and walls) and adjacent to elevator lobbies and stairwells – as well as inside elevators.

Level Theming

Level identification theming and other wayfinding aids provides an opportunity to enhance parking interior environment enhancements while also providing practical tools to assist patrons in remembering where they parked. Several creative examples are illustrated below.



Entry Signs

Emphasizing the entrance to a parking facility is important. Large illuminated signs are often used to emphasize the facility entry and attract patrons. These signs often spell out parking or use the International symbol for parking. Architectural features, such as an arch, canopy, or some different treatment of the façade, are often used to highlight the entry area as well. A height clearance bar is required for all parking structures, including the top (surface) level of below-grade facilities to prohibit over-height vehicles. Generally, the height clearance bar is located at the facility entrance(s). There may be instances when the clear height in a parking structure changes from one level to another (for example, a higher ground level than typical level to accommodate ADA vans), which may require additional height clearance bars within the facility itself. Generally, the height clearance bar is an eight-inch PVC pipe.

Having internally or externally illuminated ENTRY and EXIT signage over entry/exit lanes is another recommended best practice.

Regulatory Signs

Regulatory signs are often used in parking facilities. Examples include “STOP,” “YIELD,” “ONE WAY,” “NO PARKING” “DO NOT ENTER,” and accessible parking signs. When used, it is imperative that they comply with local and federal requirements. The *Manual of Uniform Traffic Control Devices* (*MUTCD*) provides examples of standard highway signs.

Illuminated Signs

Illuminated signs are becoming more and more common in parking facilities. Technology has advanced significantly in recent years and illuminated signs have become more reliable. Generally, illuminated signs are used for the following parking applications:

- Entry and Exit Lanes (Open in green/Closed in red)
- Facility Full Signs
- Stop (red)/Go (green)
- Level Space Capacity
- Directional Control
- Fee Display
- Space Count Systems
- Variable Message Signs

Pavement Markings

Pavement makings should conform to *MUTCD* or local standards. *MUTCD* specifies that white paint be used for markings for traffic flow in the same direction and yellow paint used for traffic flow in opposite directions, which implies a warning.

Pavement markings can be an effective way to direct and control traffic flow in a parking facility. However, pavement markings must be re-applied due to wear and deterioration from vehicular traffic. Pavement arrows may enhance traffic flow. They are often utilized on surface lots or the top level of parking structures where overhead directional signage is not possible. Traffic arrows are also commonly used in facilities with a combination of one-way and two-way traffic flow.

Drainage

Proper floor drainage is essential for all types of parking structures in all climates. While direct rain or snow may not enter all areas of the parking garage, windblown rain and snow and/or vehicles carrying ice, snow and water will distribute water throughout the facility. Heavy rains will also overload top floor drains and water will run down the ramped floors to lower levels. In addition, the frequent floor wash-downs (e.g., washing the parking surfaces/floors) that should be part of a good maintenance program are a source of water throughout the parking facility. If the floor is not adequately sloped, water can pond and deterioration will accelerate beneath the ponds.

A design slope of 2%, or ¼ inch per foot, is desired, with a minimum design slope of 1-½%. Water should be drained away from exterior columns/walls and pedestrian paths. Washes may be needed in slab corners to achieve drainage slopes.

Floor drain locations are determined by the circulation system, number of bays, and structural system. The top-level drain system should be designed to accept a 10-year design rainfall or as required by local code. Three- to four-inch piping is generally used on covered levels.

Open or Enclosed Parking Structure

Natural ventilation requires openings in exterior walls of sufficient size distributed in such a way that fresh air will enter the facility to disperse and displace contaminated air. The 2003 and 2006 International Building Code (IBC) states:

> *"For natural ventilation purposes, the exterior side of the structure shall have uniformly distributed openings on two or more sides. The area of such openings in exterior walls on a tier must be at least 20 percent of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 percent of the perimeter of the tier. Interior walls shall be at least 20 percent open with uniformly distributed openings."*
>
> *"Exception: Openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building."*

Setbacks can affect openness as firewalls are required if certain distance requirements from property lines and other buildings are not maintained. Parking structures are typically classified as enclosed if other uses (retail, office, residential) are located above the parking, but may remain open if parking is above or adjacent other uses. When a parking structure is positioned below grade, areaways can be used to achieve natural ventilation. The building code addresses the geometry required to permit acceptance of an areaway.

Parking structures classified as open do not require mechanical ventilation, fire suppression (sprinklers), and enclosed stairs.

Enclosed

- Enclosed Shafts
- Mechanical ventilation
- Increased illumination
- Increased fire rating
- Fire sprinklers

Open

- Open structures are allowed much larger floor plates and many more levels
- Open structures are naturally ventilated, so do not usually need mechanical ventilation
- Open structures do not require stairs to be enclosed
- Open structures allow a lot of natural light

Structural Systems

Following are the advantages and disadvantages of the three primary structural systems commonly used in parking structures today:

- Cast-in-Place Concrete
- Precast Concrete
- Steel Framed

The selection of the structural system should be given careful consideration. The decision is often made based on the following:

- Owner preference
- Design team preference
- Development Review Agency (or Agencies) input
- Schedule
- Construction budget
- Openness and perceived headroom
- Owner's tolerance and budget for maintenance
- Local availability of product and labor

Cast-in-Place Concrete

Advantages of Cast-in-Place Construction

- Monolithic construction so fewer sealant joints
- Positive drainage is easier to achieve
- Post-Tensioning forces reduces slab cracking
- Floor vibration imperceptible
- Flexible column spacing (20’ to 27’)
- Generally no shear walls
- Lower maintenance cost
- Wide beam spacing creates more open feeling with perception of higher ceiling
- Accommodates parking structures on irregular sites, beneath buildings, and underground

Disadvantages of Cast-in-Place Construction

- Potentially higher construction cost
- Quality control is more difficult to attain due to exposed weather conditions
- May require architectural cladding to improve exterior aesthetics
- Less adaptable to winter construction in cold climates
- Longer on-site construction schedule
- Closer expansion joint spacing
- Congestion of tendons and rebar at beam column joints
- Larger on-site staging requirement

Precast Concrete

Advantages of Pre-Cast Construction

- Quality control because members are fabricated at a plant
- Potentially lower construction cost in some regions
- Shorter on-site construction schedule
- Greater expansion joint spacing (up to 300 feet)
- More adaptable to winter construction
- Architectural façade spandrels also serve as structural load bearing elements

Disadvantages of Pre-Cast Construction

- More propensity for leaking at the joints
- Higher maintenance cost for sealants
- The close spacing of the tee stems creates the perception of lower ceiling height
- Garage structural “tee stems” can block signage and interfere with lighting distribution
- Shear walls affect architecture at the exterior and reduce visibility at the interior
- Reduced drainage slopes
- More bird roosting ledges
- Might not be performed by local subcontractors

Steel Framed

Advantages of Steel Construction

- Flexible column spacing of 18’ to 22’
- Generally no shear walls
- Can be performed by local subcontractors
- Shorter on-site construction schedule
- Potentially lower construction cost
- Easily accommodates vertical expansion

Disadvantages of Steel Construction

- Erection concerns due to mixing foundation, steel, and precast subcontractors
- Not recommended where the steel is required to be fire rated by the building code
- Depending upon code requirements, steel structure may need to be fireproofed
- Steel painting for corrosion protection
- Maintenance of steel paint system
- Steel delivery times can fluctuate
- Extensive bird roosting ledges on the beam flanges

Durability Design

It is recommended to perform an analysis in the schematic design phase to determine which durability elements should be included in the design of a parking structure. These elements include sealers, deck coatings, concrete additives, corrosion inhibitors, and epoxy coated reinforcement. Durable parking structures also require quality concrete (low water-to-cement ratio), adequate concrete cover, proper concrete curing, and good drainage. Tradeoffs between initial costs and long-term maintenance costs should be considered. Enhanced durability systems should be provided in areas with severe exposure, such as supported structure near vehicular entries and snow storage areas on the roof level. Deck coatings (membrane) are recommended over occupied space and over electrical and storage rooms.

The design of a parking structure should at a minimum conform to the intent of American Concrete Institute's *Guide for the Design of Durable Parking Structures* (ACI 362). The design life of a parking structure should be 60 years.

Incorporating Other Land Uses

Many cities today are encouraging or requiring the design of parking structures that enhance the urban environment. Design guidelines have been established that require parking structures to have level façades on the street sides (no exposed ramps) and pedestrian-active uses on the ground level. Even if not required by local code, there has been a trend away in recent years from stand-alone, single-purpose parking structures. The development of ground-floor retail space in parking structures is often encouraged as even second-rate retail space will typically generate more income per square foot than a good parking space. This is an important consideration as most new parking structures are not self supporting. When selecting a site for the development of a parking structure, the site that offers the best possibility for ground-floor retail space should be an important consideration.

- New parking structures should incorporate other land uses (e.g., first level commercial space or commercial/residential space wrapping one or more sides) whenever physically/financially possible.
- First level commercial space will increase first level floor-to-floor heights and may necessitate adjustments to the structure's ramping scheme (e.g., inclusion of non-parkable speed ramps).
- Designs should minimize the impact of commercial space on the first level circulation system.
- Designs may need to consider loading dock space and garbage space in the parking structure.
- Restaurant space will need adequate ventilation, which may impact parking efficiency on the levels above the space.
- Entry/exit locations should be adequately positioned to account for adjacent traffic patterns and roadway conditions. Entry/exits should provide for easy identification and access from adjacent streets.
- Parking demand for the integrated commercial/residential land uses should be included in the parking supply and demand analysis for the structure.
- If there is no current market for additional commercial space, the parking facility could be designed to accommodate additional land uses in the future when market conditions warrant.

Other Considerations

There are other aspects of parking structure design that will not be specifically addressed but should be kept in mind, including:

- Zoning Requirements (permitted uses, setbacks, easements, etc.)
- Building Code Compliance
- Subsurface Conditions and Foundations
- Aesthetics
- Fire Rating, Fire Protection and Life Safety
- Mechanical Systems
- Storm Drainage and Water Storage
- Parking Access and Revenue Control Equipment
- Impact of Mixed Uses (retail, residential and office)
- Parking Office Requirements
- Maintenance

Sustainable Parking Operations and Management

This chapter identifies the many areas that can be addressed when a program wishes to enhance the sustainability of their parking operations program. Ideas are presented for the parking operator or owner to consider, whether the parking system includes one or multiple facilities, and whether it is an established system or a new one.

In the introduction to the *Green Parking Garage Certification* manual it is noted that "as an asset class and building type, historically parking has lagged in the sustainability movement. Yet, parking and mixed-use structures constitute a substantial portion of the built environment. Additionally, parking and transportation have significant environmental impacts, especially regarding carbon emissions, pollution, and fuel consumption."

Parking sits at the critical intersection of the built environment and transportation modes. As such, parking structures create new opportunities to advance sustainability – both in how we plan, design, and maintain parking structures (the built environment) and our commuting and travel options (transportation modes).

Note: A more comprehensive discussion of these concepts as well as a structured approach to developing a parking operations and management program that is designed to meet specific sustainability goals can be found in the book *The Sustainability of Parking* jointly published by the International Parking Institute and the National Parking Association. (See CHAPTER 5, Sustainable Parking Operations and Management.)

It should be noted that, while this chapter references programs geared toward reducing greenhouse gasses and other climate change related issues, carbon emission reductions are necessarily the ultimate goal, but are one example of measurable outcomes if your program has adopted a climate change based philosophy. Many other ways to quantify sustainable parking and transportation program impacts exist and more are being developed as these programs evolve.

Sustainable Parking Operation and Management Checklist

The following check list of sustainable parking and transportation demand management strategies was developed after reviewing several current texts on this topic as well as reviewing programs such as LEED, Green Globes and the Green Parking Council. This checklist provides a wide range of options in a number of categories designed to promote:

- Increased energy efficiency and performance
- Reduced environmental impact
- Efficient parking space management
- Integrated sustainable mobility services and technologies
- Enhanced performance as mobility hub
- Stronger community relationships

The Green Parking Council uses a standard that is organized into four major categories: Management. Programming Technology/Structure Design and Innovations.

- **Management** highlights ways in which garage operations can maximize the use of a parking asset while minimizing waste. Embracing these practices ensures facility staff utilizes resources to their full potential.
- **Programming** guides garages to new revenue sources, greater customer satisfaction and stronger community relations. Green garage programs ensure effective vehicle ingress/egress, provide access to alternative mobility solutions, and leverage the garage's potential as a public space.
- **Technology and Structure Design** outlines the physical attributes a garage can deploy to increase energy efficiency, lower waste and support customer mobility choice.
- **Innovations** focuses on emerging sustainability initiatives and concepts that while not yet in the mainstream usage provide creative ideas and inspiration for potential future adoption.

The Sustainable Parking Operation and Management Checklist is organized into the following categories:

1. Planning
2. Parking Management
3. Facility Design/Layout
4. Demand Reduction / Transportation Demand Management (TDM)
5. Alternative Transportation Support Programs
6. Wayfinding and Parking Guidance
7. Use of Recyclables
8. Energy Savings/Generation Strategies
9. Water Management
10. Facility Maintenance and Cleaning
11. Electric Vehicle Charging
12. Green Garages

1. Planning
   - Integrated Parking and Transportation Planning
     - Develop a parking strategic plan in conjunction with a larger community-wide transportation plan
   - Parking Requirements or Guidelines
     - Ensure parking requirements or guidelines (where exempt) are appropriate and right-sized for the environment
   - Flexible Zoning Code Standards
     - Adopt flexible zoning code standards that take multiple factors into account
   - Environment Specific Parking Ratios
     - Develop a parking space-to-gross square foot (GSF) ratio goal that reflects essential need
     - Use the target ratio in parking planning appropriate for the environment
   - Shared Parking
     - Promote shared parking whenever possible
     - Utilize the ULI Shared Parking Model to promote the rightsizing of parking development (taking advantage of complementary peak parking accumulation patterns by certain combinations of land-uses when the parking resources can be effectively shared).
     - Encourage and design parking facilities to support shared parking.
   - Parking Location Planning
     - Consider providing public parking in locations that strategically supports an area or district.
     - Plan for some additional public supply when a new development is created to anticipate adaptive reuse and in-fill projects in the area
     - Strategically consider the proximity of parking facilities to transit resources to promote a park once environment.
   - Life Cycle Cost Assessment
     - Conducting a life cycle cost assessment especially of durability design elements, may increase initial facility development costs, but can provide significant savings in terms of long-term life cycle costs for a parking facility.

2. Parking Management
   - Charge for Parking
     - Charging market rates for parking makes the public aware of the fact that parking is never free and promotes consideration of alternatives.
     - Implement demand-based parking pricing strategies.
     - Coordinate on and off-street parking rates:
     - Set pricing for on-street parking to promote short-term, high turnover parking
     - Set off-street pricing to encourage longer-term parking
   - Develop a parking allocation program based on essential need
     - The way we allocate our resources gets to heart of a parking program's philosophy and core principles. If sustainability is considered a core value, then decisions related to parking resource allocation should reflect sustainability principles. For example, at the Seattle Children's Hospital, all parking is provided only on a daily fee basis (monthly parking charges were eliminated). With no sunk costs related to monthly parking passes, other commute options are encouraged.
     - Develop parking policies designed to meet the needs of multiple parking patron types (i.e., commercial, retail, residential, etc.)
   - Reserved Parking Areas
     - In general, the use of reserved parking is discouraged in that it promotes inefficiency in utilizing available resources and limits the ability to share and over-sell spaces

  - Implement or expand reserved areas for car/vanpools
  - Implement or expand reserved areas for hybrid/low emission vehicles
- Discounted Parking Rates and special offers
  - Offer clean air car discounts or green parking permits (i.e., reduced parking rates) for car/vanpools
  - Offer clean air car discounts or green parking permits (i.e., reduced parking rates) for hybrid/low emission vehicles
- Technology
  - Help drivers exit the garage with little or no idle time with traffic control (i.e. pay-on-foot kiosks, automatic vehicle identification (AVI) technology, etc.)
  - Evaluate space availability systems to reduce the search time for spaces within parking facilities
- Special Programs/Events
  - Participate in annual events such as Parking Day to promote awareness of program alternatives
  - Offer tire inflation stations to encourage proper tire pressure which can contribute to increased fuel economy
  - Work with local TMAs or Transit Agencies to develop and promote Transportation Fairs or other community-based programs to educate and encourage the use of transportation alternatives

3. Facility Design/Layout

- Facility Design
  - Consider green roofs (vegetation), blue roofs (retains water), or cool roofs (roof coated with a light colored, solar reflective materials)
- Facility Lighting
  - Light with energy-efficient fixtures/re-evaluate lighting types (consider replacement with LED or fluorescent lights to reduce power usage)
  - Develop a fluorescent lamp recycling program
  - Stain or paint interior parking garage surfaces to maximize reflectivity and enhance facility lighting without increasing energy costs
  - Consider the use of sensors/timers to reduce light levels in certain zones when not in use, or during daylight hours
  - Evaluate individually powered solar parking lot lights
- Parking Layout
  - Assess current parking space layouts, and consider options to maximize use of existing spaces

4. Demand Reduction / Transportation Demand Management (TDM)

- Evaluate changes to parking pricing that could reduce parking demand
  - Belong to an organized Transportation Management Association
  - Provide easy access to alternatives
  - Consider restricting parking availability
  - Offer discounted transit passes and sell them along with parking permits
  - Develop a commute options program to make patrons more aware of the alternatives to driving alone
  - Offer a parking cash-out option
    - Commute bonus for alternative commute—up to $65/month (pre-tax deduction)
  - Develop an on-line commute management system that allows employees to claim commute bonus, track parking charges and plan alternative commute trips and find carpool/vanpool partners.
  - Offer an option to the traditional monthly parking contract – Consider offering a parking scratch-off card
    - Unbundle monthly parking by offering a punch card option instead of a traditional access card
    - Drivers only pay for days they drive
    - Creates an incentive to consider alternatives to driving

- Support Active Transportation Program Development
  - Promote zero-impact modes of travel
  - Add or expand secured parking facilities for bikes
  - Company bike or a free bike for an employee who commits to bike to work at least 2 days/week
  - Implement a program of providing temporary bike racks to handle seasonal demand peaks for bike parking. The temporary bike rack pictured to the right takes up only one on-street parking spaces
  - Implement or participate in promoting a bike-share program
  - Offer parking for bicycles
  - Offer bike sharing (or have one nearby)

- Marketing and Communications
  - Improve marketing of transportation alternatives
  - Improve TDM marketing outreach to include direct participation in all new student and employee orientations
  - Solicit and convey vanpool and bus club customer testimonials about their positive experiences as members
  - Solicit/Expand transportation department's participation in the larger community Sustainability Committees or Transportation Master Planning processes
  - Promote an increase in funding for pretax transit and downtown shuttle programs
  - Generate/Expand car-sharing program participation through user-based promotional efforts
- Fleet Management
  - Reduce campus fleet vehicles' reliance on fossil fuels
  - Increase percentage of "alternative fuel" vehicles in fleet
  - Expand car-share fleet to meet daily vehicle trip demand of departments, employees, and students
  - Integrate campus or corporate fleet management with carsharing programs providing faculty, staff, and students with instant access to a fleet of vehicles within walking distance from campus or downtown offices
  - Offer reserved or discounted parking for vanpool or carpool customers
  - Provide reserved or discounted parking for fuel efficient vehicles
  - Provide reserved or discounted parking for alternative fuel vehicles

5. Alternative Transportation Support Programs

- Provide or support a range of transport alternatives
  - Increase the amount and types of bike parking
  - Become a funding partner for campus or community bike rental programs
  - Invest in changing rooms/showers
  - Partner with bike concierge services
  - Provide reduced priced parking in remote ride sharing collector lots, supported by transit of shuttle programs

6. Wayfinding and Parking Guidance
   - Improve parking signage and information
     - Help drivers find your parking facility more easily with enhanced signage and wayfinding outside of your garage
     - Consider incorporating parking availability data into external and internal parking signage
     - Help patrons locate available spaces more quickly and efficiently with internal wayfinding
     - Evaluate or implement parking guidance systems to improve parking efficiency
     - Develop a parking availability/location mobile device application to reduce the circling of vehicles

7. Use of Recyclables
   - Recyclable Resources
     - Replace all light bulbs in office environments with compact fluorescent bulbs
     - Replace concrete parking and traffic products with those made from 100% recycled rubber (e.g., wheel stops, speed humps, sign bases, etc.)
     - Implement a parking garage lighting recycling program (especially if fluorescent lighting fixtures are in use.)
     - Offer recycle bins for patrons and employees
     - Purchase recycled, organic or local products
     - Recycle disposed materials, use local labor, or source local or recycled materials when undergoing new construction or renovations

8. Energy Saving/Generation Strategies
   - Energy Related Strategies
     - Have climate controlled occupied areas (programmable thermostats/sensor controls)
     - Have an open air design with no ventilation system in the parking areas
     - Ventilate the decks with variable controlled air flow (i.e., VFD) or sensor activated (i.e., DCV) technology
     - Generate renewable energy (i.e., solar PV, wind turbines, hydroelectric)
     - Cover parking lots and garage roofs with solar panels.
     - Generate renewable energy strategies (i.e., solar PV, wind turbines, etc.)

9. Water Management
   - Water Saving
     - Replace plumbing fixtures with water-saving fixtures
     - Use water-efficient landscaping (e.g., xeriscaping/native plants to reduce irrigation needs)
     - Develop a storm water management plan
     - Capture grey water for use in watering parking landscaped areas

10. Facility Maintenance and Cleaning
    - Maintenance, Recycling and Environment Enhancements
      - Implement on-site wastewater treatment
      - Use sustainable cleaning supplies/Clean with green, non-toxic cleaning products
      - Apply low- or no- VOC (Volatile Organic Compound) coatings to all surfaces
      - Make interior spaces tobacco free
      - Add recycling containers for all facilities where they are convenient to patrons and staff

11. Electric Vehicle Charging

- Promote the use of non- or reduced- emission vehicles
    - Provide charging stations for electric vehicles
    - Develop electric vehicle charging system specifications

12. Green Garages

- Consider third party sustainability certifications, such as LEED or Green Globes
- Adopt a standard that all parking construction will seek a LEED ®-based equivalency rating of Silver or better when feasible and/or Green Parking Council standards.
- Adopt a standard for new garage development that solar arrays that generate up to 50% of the facility's power needs must be integrated

APPENDIX D: CRITERIA FOR ASSESSING PUBLIC/PRIVATE PARKING PROJECTS

Parking can be a powerful development incentive but must be applied in a fair and consistent manner that advances the larger community strategic goals. The following issues are examples of the type of criteria that we recommend as part of the assessment for either committing a significant number of existing parking resources or developing future parking assets as an element of a public/private partnership project.

When evaluating whether the City will consider an investment in parking to encourage or incentivize a new development project, the following standard set of questions should be answered upfront:

Alignment with Community Goals

1. Does the proposed development contribute to the economic health of the downtown/community? Describe the envisioned contributions.

2. Does the proposed development project include prioritized or highly valued development goals or program elements supported by the City of Raleigh and/or the Downtown Raleigh Alliance (DRA)?

3. Are the proposed land uses or combination of land uses associated with this project appropriate for the specific area?

4. Is the proposed development project in alignment with the downtown master plan and/or strategic plan?

5. Does the proposed development project incorporate special elements valued by the City, DRA, and other community groups/plans? If yes, specify.

6. Does the proposed development project create any unusual or unacceptable parking or traffic impacts?

7. Is the developer willing to develop new parking assets in accordance with newly developed City parking structure design guidelines to ensure compliance with downtown development standards and parking structure design best practices?

8. Has the initial economic development impact of the project been estimated? What is the anticipated project impact in the following areas?

    a. New jobs for downtown?

    b. Jobs retained in downtown?

    c. Increase in property taxes/TIF contributions?

    d. Estimated increase in sales tax revenue?

    e. Stimulation of additional development?

    f. Stimulation of additional support jobs?

g. Support of existing retail, restaurant, and other service providers?

9. Is participation in this development project appropriate and consistent with the downtown master plan or the "Downtown Experience Plan"? If so, please describe.

Parking System Support/Program Management – General Guidelines

Another set of questions is proposed below that addresses the potential impact of proposed development deals as they relate to the existing parking management program. Supporting and enhancing the financial and operational influence of the parking and access management program going forward should be a priority as this function can have an important impact on the health and vitality of an effective urban environment.

1. Will this project generate additional parking revenue to support or contribute positively to the City's parking program?

   a. If yes, specify:
      i. Estimated spaces contracted: _____
      ii. Estimated annual revenue: _____

2. Does this proposed development project create any new or unusual operating expenses that might negatively impact the City's parking program?

3. Are there opportunities for the City's parking program to operate any new parking capacity for a management fee? Is this desirable relative to this specific project?

4. Is the net financial impact of this project on the City's parking program expected to be positive?

5. Are the activities proposed, relative to participation in this development opportunity, in compliance with the City's parking program bond covenant requirements/restrictions?

6. Are there opportunities for partnership/collaboration with the developer or property management firms relative to overall downtown parking program goals?

   a. Does this project create any possible public use of spaces after typical weekday work hours, weekends, holidays, etc.?

   b. Does this project create any possible shared parking opportunities?

7. Does this development project create any special conditions that undermine the financial or market position of the City's parking program?

APPENDIX E: RECOMMENDED PARKING MANAGEMENT INTERNAL BENCHMARKS

#	Benchmark Name	Type	Description
1	Total operating cost per space.	Cost	**Overall key benchmark.** Useful for year to year comparisons and for comparisons with operations of similar profiles. Divides total operating expenses by number of parking spaces.
2	Total revenue per space.	Productivity	**Overall key benchmark**. Measures revenue to size of program in relation to spaces.
3	Facilities and equipment long-term debt per space.	Cost	Measures total long-term debt to size of program in terms of spaces.
4	Percent of annual revenue committed to current principal and interest payment.	Relationship	Measures amount of revenue consumed by current debt payments.
5	Debt for facilities and equipment incurred for the last five years per space.	Cost	Measures 5-year debt assumption for facilities and equipment against size of program in terms of spaces. Important in setting baseline measurement for comparison with multi-year year parking improvement plans.
6	Average monthly permit revenue per space.	Relationship	Measures the monthly permit revenue to the number of spaces.
7	Total operating costs per Parking department FTE.	Cost	Useful for internal year to year tracking and comparisons to other operations with similar profiles. Divides total operating expenses by departmental FTE.
8	Total revenue per Parking department FTE.	Efficiency	**Overall key benchmark.** Measures income to staffing level.
9	Parking spaces per Parking department FTE.	Productivity	**Overall key benchmark.** Measures total staffing to size of program in relation to parking spaces.
10	Surface parking lot spaces as a percent of total spaces.	Relationship	For profile comparisons, this shows the balance between surface lot spaces and structured or on-street spaces.
11	On-street parking spaces as a percent of total spaces.	Relationship	Shows balance between on-street parking and surface lots or structured spaces.
12	Structured parking spaces as a percent of total spaces.	Relationship	Shows balance between structured spaces and street or surface lot spaces.
13	Administrative cost per space.	Cost	Measures administrative costs to size of program in respect to number of spaces.
14	Administrative costs as a percent of total costs.	Relationship	Reflects the portion administrative costs represent as a part of the whole. Look for "norms" within your peer group. Compare to operations with similar management profiles.
15	Security costs per space.	Cost	Measures security expenses to the size of the facility or operation.
16	Security costs as a percent of total costs.	Relationship	Reflects the portion security costs represent as a part of the whole. Look for "norms" within your peer group. Compare to operations with similar security profile.
17	Total enforcement process costs per space.	Cost	Quantifies total enforcement process costs by measuring to number of spaces in the program. Compare with similar enforcement profiles. (Total enforcement includes: issuing warnings/citations, processing, adjudication, and collections.)
18	Total maintenance costs per space.	Cost	Measures total maintenance expense to the size of the program in respect to spaces. Compare to operations with similar maintenance profiles. Match weather characteristics and American Concrete Institute (ACI) "durability zones".
19	Total maintenance costs as a percent of total operating costs.	Relationship	Reflects the portion of total operating costs which all maintenance absorbs. Match weather characteristics and American Concrete Institute (ACI) "durability zones" when making comparisons.
20	Equipment maintenance cost per space.	Cost	Measures equipment maintenance costs by size of program in respect to spaces.
21	Equipment maintenance costs as a percent of total maintenance costs.	Relationship	Measures what percent of maintenance costs are absorbed by equipment maintenance.
22	Equipment maintenance costs as a percent of total operating costs.	Relationship	Measures equipment maintenance costs as a percent of total operating costs.
23	Cashier station costs per space.	Cost	Measure cost of cashier operations to size of program in relation to spaces.
24	Cashier FTEs per space.	Productivity	Measure cashier staffing levels to size of program in respect to spaces.

APPENDIX F: SHARED USE MOBILITY OVERVIEW

- Shared Mobility Summit 2016 and the Future of Urban Mobility
  - Introduction
  - Conference Overview
  - Conference Themes
  - The Expanding Shared Mobility Ecosystem

Shared Mobility Summit 2016 and the Future of Urban Mobility

Introduction

Anticipating that Shared Mobility would be an important element in the Downtown Development and Future Parking Needs study for Downtown Raleigh project, I petitioned Kimley-Horn to allow me to attend the Shared Mobility Summit conference held in Chicago this past October. This was the second year for the conference, but my first time attending this new offering.

This submittal documents my notes from attending this interesting conference with the primary focus on how these emerging shared mobility strategies might be incorporated into our Downtown Development and Future Parking Needs study.

Conference Overview

The Shared Mobility Summit was billed as a platform to "discuss the latest developments in carsharing, bikesharing, ridesourcing, microtransit and an opportunity to network with the newest companies, the boldest cities and the nation's leading mobility experts and change-makers."

The conference was attended by an interesting assortment of federal, state and local policy leaders; transportation agencies; transportation network companies; transportation entrepreneurs/startups; auto manufacturers; equipment vendors; and even parking specialists who are beginning to make the transition from parking-focused programs to broader mobility or access management platforms.

Conference Themes

There were several larger themes intertwined among a range of session topics. Below are a few of these themes that apply to broader transportation policy goals and could be applied to the parking industry.

People-Centric Planning and Design

There was positive recognition that beyond all the technical aspects of the conference, we would ultimately need to remember that all the programs, technology, and innovation needs to retain a people focus. Transportation and parking are support systems that enable other activities. This applies to many areas such as land use, technology, smart infrastructure, and policy development.

Better and Different Data Platforms and Analytics

There was a strong and recurring focus on the need for better and different types of data, i.e., data that goes beyond traditional metrics such as vehicles miles travelled (VMT) and planning for additional roadway capacity and places more emphasis on larger context issues such as transportation equity, place making, quality of life, sustainability and changing consumer preferences). This new focus on problem identification and desired outcomes that embrace larger community development societal goals also is reflected in programs such as the U.S. Department of Transportation's Smart City initiative.

Transportation as an Element of Social Equity Solutions

Another important theme that emerged in many sessions was a sensitivity to and understanding of the importance of social equity issues as it relates to transportation. This issue has elements that impact job creation, social justice, and an embrace of diversity in many forms and environments. This was sometimes expressed in terms of "reframing transportation priorities" or "ensuring that technology-based transportation options don't create equity barriers." The goal of promoting equity was powerfully summarized by the City of Pittsburgh in the phrase, "If it's not for all, it's not for us." Transportation equity issues were another link back to the people focus theme mentioned above.

Multimodal Systems Integration

Another related theme was the promotion of multimodal systems integration and the creation of a comprehensive and seamless customer experience that promotes all forms of transportation as the best way to improve community access overall. This theme harkens back to the connected traveler concept that promotes dissemination of information on all modes via the new and growing universe of communications options available today.

Shared Mobility – A Complement or Competitor to Public Transit?

There was much discussion related to whether the emergence of shared mobility strategies was a threat or a complement to public transit systems. While there were several issues and opinions on this topic, the overwhelming opinion of the experts and practitioners in the audience was that shared mobility was very much a complement to public transit systems, which is still most cost-effective means to move high volumes of commuters in limited urban street networks.

Carpe Diem!

Finally, there was a real sense of urgency that it was now time to embrace the change that is not coming, but that is already here—helping to solve many of the larger issues that emerge as our urban environments continue to evolve and densify. This, combined with a recognition that traditional approaches to transportation planning (more focused on vehicles and roads than smart mobility options) will not help us solve the larger issues of equitable housing, job creation/retention, public safety, environmental sustainability, and community resiliency. This theme of how we transform our cities and other key activity centers for the public good and identifying the role of this new shared mobility reality, was infused throughout a wide range of technical sessions.

Mobility as A Service

Another topic area that I have been tracking during the past couple of years is the concept of multimodal mobility as a service. This contrasts with mobility as a product that one might own. This fascinating area brings together many of the elements and themes discussed above, embraces, and leverages our new abilities to easily access a range of combined mobility services via our smartphones, vehicles, and other devices. A listing of the categories of programs, services, and innovations that make us an ecosystem of shared mobility options. Integrated mobility service platforms are emerging as a smart alternative to vehicle ownership in a rapidly urbanizing world. Mobility as a service offers new and easy ways to access a wide range of transportation options that can be tailored to better meet customer needs and also address a range of issues related the fact that soon nearly two thirds of the world's population will be living in megacities.

The future of urban public transport lies in mobility systems that will provide bicycles, cars, and other mobility services on demand. Most mobility assets will be "shared" instead of "owned" by users (shared-use mobility). Convenient and reliable lifestyle services will be offered to connected travelers who will be able to easily access these combined mobility services via their smartphones and other devices. These services will become viable alternatives to car ownership as they are more tailored to customer needs and will ultimately be more cost-effective, environmentally sustainable, and will reflect the lifestyle choices of a next generation. However, we must be sensitive to the fact that not everyone can afford a smartphone and related social equity issues.

Combined mobility services take the concept of shared-use to a new level, recognizing that the desires for flexibility and efficiency which are driving consumers to shared-use mobility solutions are further advanced when those solutions can be offered in an integrated platform. For those communities, institutions and providers of mobility solutions that make the transition to integrated mobility services, these developments offer a real opportunity to deliver sustainable growth, reduced congestion and improved access during the next decades.

The Expanding Shared Mobility Ecosystem

I recently found document that illustrated how far we have come in the evolution of shared mobility resources and options. This ecosystem map was created for the Silicon Valley Mobility as a Service project, where mobility aggregators are beginning to integrate various programs and services.

The menu of shared mobility options below identified the following major categories related to mobility as a service. Examples for each category are provided for clarity.

- Enterprise Commute Trip Reduction
    - Leverages technology focused on managing mobile devices, wireless networks, and other mobile computing services in a mobility management and commute trip reduction context.
        - Examples: Luum, Ride Amigos, etc.
- Mobility Aggregators
    - Mobility aggregators are public transit apps and mapping services developed by several companies focusing on trip planning, live arrival and departure times, up-to-date line schedules, local station maps, service alerts, and advisories that may affect one's current trip.
        - Examples: Moovit, Moovel, Urban Engines, etc.
- Public Transit
    - Traditional public transportation systems
        - Examples: Rochester Public Transit
- Private Sector Transit
    - Entrepreneurial private sector transit options are emerging when traditional transit systems cannot meet all the local demand. Startups such as “Chariot” are providing new customized commute options typically using 14-passenger vans. Specific routes are requested by commuters via crowdsourced. When a critical mass in a neighborhood is reached by commuters reserving their first “Chariot Pass,” a new route is launched within days.
        - Examples: Bridj, Chariot, Go Carma, Via, etc.
- Rideshare Within 10 Minutes
    - Like normal transportation network providers such as Uber or Lyft, these services allow you to share the ride and the cost while reducing the number of vehicles on the road.
        - Examples: Lyft Carpool, UberPool, Ford Dynamic Social Shuttle, etc.

- Rideshare Within 24 Hours
    - Services that make carpooling convenient, social and productive by giving riders flexibility and choice in finding carpooling partners a chance to meet others with similar interests while reducing the time and costs of driving to work.
        - Examples: Carma, HOVee Carzac, etc.
- Taxi-like services
    - Traditional taxi services and the newer generations of app-based ride-hailing services.
        - Examples: Lyft, Uber, Juno, Sidecar, etc.
- Carshare
    - A model of car rental where people rent cars for short periods of time, often by the hour. They are attractive to customers who make only occasional use of a vehicle, as well as others who would like occasional access to a vehicle different than the type they use day-to-day. The organization renting the cars may be a commercial business or the users may be organized as a company, public agency, cooperative, or ad hoc grouping.
        - Examples: Car2Go, Zipcar, Enterprise Car Share, etc.
- Peer-to-Peer (P2P) Carshare
    - P2P carsharing (also known as person-to-person carsharing and peer-to-peer car rental) is when existing car owners make their vehicles available for others to rent for short periods of time.
    - A form of person-to-person lending or collaborative consumption, as part of the sharing economy. The business model is closely aligned with traditional car clubs such as Streetcar or Zipcar, but replaces a typical fleet with a virtual fleet made up of vehicles from participating owners. With P2P carsharing, participating car owners can charge a fee to rent out their vehicle when they are not using it. Participating renters can access nearby and affordable vehicles and pay only for the time they need to use them.
        - Examples: Getaround, RelayRides, Ford Car Swap, etc.

- Bikeshare
    - A service in which bicycles are made available for shared use to individuals on a very short term basis. Bikeshare programs allow people to borrow a bike from point A and return it at point B. Many bikeshare systems offer subscriptions that make the first 30–45 minutes of use either free or very inexpensive, encouraging use as transportation. This allows each bike to serve several users per day. In most bikeshare cities, casual riding for several hours or days is better served by bicycle rental than by bikeshare. For many systems, smartphone mapping apps show nearby stations with available bikes and open docks.
        - Examples: Motivate, DecoBike, Bcycle, NextBike, etc.
- Personal Electric Transport
    - A bicycle with an integrated electric motor which can be used for propulsion. There are a great variety of e-bikes available worldwide, from e-bikes that have a small motor to assist the rider's pedal-power (i.e., pedelecs), to more powerful e-bikes which tend closer to moped-style functionality. All retain the ability to be pedaled by the rider and are therefore not electric motorcycles.
        - Examples: Enzo Foldable E-Bike, GenZe Electric Bikes, Scoot (heavy scooter rental), etc.
- Vanpooling
    - An element of a transit system that allows groups of people to carpool on a larger scale, saving fuel and vehicle operating costs. Vanpools have a lower operating and capital cost than most transit vehicles in the United States, but due to their relatively low capacity, vanpools often require subsidies comparable to conventional bus service.
        - Examples: Enterprise, Vride, etc.
- Commute Mode Detection Technologies
    - Uses GPS data from mobile devices to document commuter modal choices including origin and destination data.
        - Examples: Strava, MapMyRide, Moves, etc.
- Smartphone Transit Payment
    - Incorporates transit payments into mobile devices to make paying for commute options easier.
        - Examples: Passport, GlobeSherpa, Masabi, etc.

- Smartphone Parking
    - Incorporates parking payments into mobile devices to make paying for parking easier.
        - Examples: ParkMe, Parkmobile, Pay-by-Phone, etc.
- Miscellaneous Apps
    - There are a variety of apps now available to help commuters better understand their commute options and even assist in commuter trip planning.
        - Examples: City Mapper, Transitscreen, Modeify – TDM Trip Planner, etc.
- Commuter Benefits
    - Tax-free commuter benefits, also known as qualified transportation fringe benefits, are employer-provided, voluntary benefit programs that allow employees to reduce their monthly commuting expenses for transit, vanpooling, bicycling, and work-related parking costs. The benefit is a federal tax benefit authorized under the Internal Revenue Code Section 132(a). Several companies are emerging to help larger institutions work with commuters to maximize these potential benefits and promote alternative modes.
        - Examples: Commuter Check Direct, Commuter Benefits, Wageworks, etc.
- Robotaxi
    - An autonomous car capable of sensing its environment and navigating without human input used as a taxi-like service.
        - Example: Uber with a Robotic Driver.
- Personal Rapid Transit (PRT)
    - Also referred to as podcars, PRT is a public transport mode featuring small automated vehicles operating on a network of specially built guideways. PRT is a type of automated guideway transit (AGT), a class of system which also includes larger vehicles all the way to small subway systems.
    - PRT vehicles are sized for individual or small group travel, typically carrying no more than 3 to 6 passengers per vehicle. Guideways are arranged in a network topology, with all stations located on sidings, and with frequent merge/diverge points. This allows for nonstop, point-to-point travel, bypassing all intermediate stations. The point-to-point service has been compared to a taxi or a horizontal lift (elevator).
    - Numerous PRT systems have been proposed but most have not been implemented.
        - Examples: 2getthere, Ultra Global (London Heathrow), etc.

- Niche Ride Match
    - Connects intercity drivers and passengers through social networking.
        - Examples: Zimride, Otto (eRide Share), etc.
- Single-Occupant Vehicle (SOV) Apps
    - Community-based traffic and navigation apps that can connect drivers in a local area to share real-time traffic and road info, saving time and money on daily commutes.
        - Examples: WAZE Social Traffic, Twist for Rendezvous, etc.
- Niche Transport
    - A variety of specialized transport options which could include water taxis, pedicabs, etc.
        - Examples: Boost by Benz, Shuddle, HopSkipDrive, etc.

As parking and TDM programs merge to offer more comprehensive tapestries of access and mobility management strategies, this summary of shared mobility offerings illustrates the scope, variety, and evolution of this emerging area of our industry that we now call shared mobility.

Looking at this document from a different perspective reveals another dimension. Beyond the specific practices, there are broader categories (e.g., mobile communications, data aggregation, commute mode detection, personal transport, active transportation, private sector transit, commuter benefits) that are driving the innovation of new approaches. In some cases, it is the intersection of these broader categories that are generating new synergistic applications and approaches that will have the potential to be both transformative and disruptive to our industry.

The growing shared mobility phenomena ties directly to the recommendation to expand the focus of the parking program beyond "just parking" to embrace more of an "access management" or "mobility management" approach.

Practical applications of this approach could include such specific strategies as providing more drop off/pick-up spaces for Uber/Lyft or other shared mobility options, supporting or even co-funding bike share and/or TDM programs. As parking pricing increases over time, providing more remote parking with a shuttle program to provide lower cost parking options for lower wage employees. TDM support could include car/van pool support (preferential parking) programs, parking cash out options, parking scratch card options as an alternative to monthly parking, which makes parker's more aware that they have "commute options", and that they can save parking money if they can work from home or carpool one or two days per week, etc. In the long run, all modes will need to be maximized to ensure that these strategies are ultimately more cost effective and sustainable than structured parking as the only solution.

The promise and potential of these evolving products, applications, and strategies to improve access and mobility while simultaneously addressing other important issues such as congestion mitigation, greenhouse gas emission reduction, and the promotion of a more sustainable transportation network is exciting.

APPENDIX G: BUSINESS STRATEGY SCORECARD TEMPLATE

Downtown Raleigh Business Strategy Scorecard

With Parking Support Data

Land Use	10 Year Baseline Targets	Beginning Year	Completed Year	Percent of Target Completed by Year-End 2010	Projects in the Pipeline	Targeted Priority Aligned with DT Master Plan*	Shared Parking Applicable?	Public Parking Investment w/in 3 Blocks
Office Projects (in square feet)						Yes / No	Yes/Limited/No	Available Spaces:
Project # 1 - Name								
- Brief Description								
- Address								
Project # 2 - Name								
- Brief Description								
- Address								
Project # 3 - Name								
- Brief Description								
- Address								
Project # 4 - Name								
- Brief Description								
- Address								
Project # 5 - Name								
- Brief Description								
- Address								
Apartment Projects (in units)						Yes / No	Yes/Limited/No	Available Spaces:
Project # 1 - Name								
- Brief Description								
- Address								
Project # 2 - Name								
- Brief Description								
- Address								
Condominum Projects (in units)						Yes / No	Yes/Limited/No	Available Spaces:
Project # 1 - Name								
- Brief Description								
- Address								
Project # 2 - Name								
- Brief Description								
- Address								
Retail Projects (in square feet)						Yes / No	Yes/Limited/No	Available Spaces:
Project # 1 - Name								
- Brief Description								
- Address								
Project # 2 - Name								
- Brief Description								
- Address								
Hotel Projects (in square feet)						Yes / No	Yes/Limited/No	Available Spaces:
Project # 1 - Name								
- Brief Description								
- Address								
Project # 2 - Name								
- Brief Description								
- Address								
TOTALS:								

Notes:

* A "Yes" Qualifies the project as eligible for special development incentive consideration.